

# **Disorders of Copper Homeostasis and Homoeopathy**



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## Introduction

There are certain disorders of copper metabolism which cause mild to fatal manifestations in human body. They fall into either primary or secondary categories-

- Primary disorders of copper metabolism are genetic disorders like-
  - Menkes disease
  - Occipital horn syndrome
  - Aceruloplasminemia
  - Wilson disease
- Secondary or acquired ones include-
  - Tyrolean infantile cirrhosis (TIC)
  - Indian childhood cirrhosis (ICC)
  - Idiopathic copper toxicosis (ICT)

## Primary or genetic disorders of copper metabolism

### Menkes disease

- X-linked neurodegenerative disorder in infants (Syphilis)
- Characterized by poor growth and unusual kinky or curly hair texture (Psora/ Syphilis/ Sycosis)
- Manifested primarily in males
- Low plasma ceruloplasmin and decreased copper concentrations in the liver and brain (Syphilis)
- The morphological changes start in utero and fully manifest during the perinatal period (Psora)
- Premature birth and being small for gestational age are frequent characteristics (Psora)
- Hypothermia, prolonged jaundice, feeding difficulties, and diarrhea in the neonatal period (Psora)
- Developmental delays around the third month like abnormal head movement and the absence of a smiling response (Psora/ Syphilis)
- Therapy-resistant convulsions (Psora)

### Pathophysiology of Menkes disease

- There is a defect in the protein ATP7A gene, a membrane-bound Cu-ATPase (Syphilis)
- This gene regulates the outward flow of copper ions from the interior to the exterior of the cell (Psora)
- There is failure to transport copper ions completely across the intestinal mucosa, ultimately leading to a severe copper deficiency in the peripheral organs (Psora)
- This causes copper accumulation in the intestinal cells (Psora/ Sycosis)
- Copper transport across the blood-brain barrier also impaired (Psora)

### Occipital horn syndrome

Menkes and OHS have a similar abnormality in copper metabolism but the clinical presentations and survival potentials are different-

- It has late and inconsistent onset of symptoms
- At minimum 2 years of age a definitive diagnosis of OHS is possible
- A prominent protuberance or exostoses in the occipital bone seen on radiographs evidences it (Sycosis)

- Other skeletal abnormalities being short and broad clavicles, osteoporosis, laxity of the skin and joints, and bladder diverticula (Sycosis/ Syphilis)
- Serum copper and ceruloplasmin low in some (Syphilis)
- Arrested mental development and late-onset seizures and borderline intelligence (Psora/ Syphilis)
- Inguinal hernias, recurrent diarrhea, urinary-tract infections and distorted facial features, such as high foreheads and hooked noses (Psora/ Syphilis)
- Radiographs show tortuous cerebral blood vessels with multiple branch occlusions (Psora/ Sycosis)

#### Pathophysiology of Occipital horn syndrome

OHS was formerly called X-linked cutis laxia.

- Mutations in the Menkes gene can also result in OHS (Syphilis)
- It is a milder form of classical Menkes disease in which the same copper transporter, ATP7A, is affected

#### Wilson disease

Wilson disease, or hepatolenticular degeneration, is an autosomal recessive disorder that results from accumulation of copper predominantly in the liver and brain. The accumulation is due to defective biliary excretion of copper. Menkes disease is X linked while Wilson disease is an autosomal recessive disorder. There are certain facts about this disease-

- The adult humans need to ingest about 0.75 mg of copper daily to sustain a balance
- Typically, humans ingest about 1 mg of copper per day
- The daily excess of copper averaging about 0.25 mg per day is normally excreted in the feces
- Due to a genetic defect, individuals with Wilson disease are unable to excrete the excess copper, resulting in a cumulative accumulation of copper in the body (Psora/ Syphilis/ Sycosis)
- Clinically symptoms appear in hepatic, neurological, or psychiatric symptoms, in roughly equal proportions

#### Pathophysiology of Wilson disease

- There is a genetic defect in Wilson disease is in ATP7B gene, which encodes a copper transport protein (Syphilis)
- Wilson patients usually have low blood ceruloplasmin levels (Syphilis)
- Some patients with chronic cirrhosis are idiopathic, also called cryptogenic and may have Wilson disease (Syphilis)
- A few with hepatitis C may actually have undiagnosed Wilson disease

#### Sign and symptoms of Wilsons disease

##### *Liver-related*

- Edema- the swelling of legs and abdomen (Psora/ Sycosis)
- Feeling tired (Psora)
- Itching (Psora)
- Jaundice (Psora)
- Loss of appetite (Psora)
- Muscle cramps (Psora)
- Nausea (Psora)
- Pain or bloating in the abdomen (Psora)

- Spider angiomas (Psora/ Sycosis)
- Vomiting (Psora)
- Weakness (Psora)
- Weight loss (Psora/ Syphilis)

#### *Neurological*

- Abnormal walking (Syphilis)
- Changes in mood (Psora)
- Clumsiness with hands (Psora)
- Depression (Psora/ Syphilis)
- Drooling (Psora/ Syphilis)
- Insomnia (Psora)
- Memory, speech, or vision impairment (Psora)
- Migraines (Psora)
- Personality changes (Psora)
- Problems in school (Psora)

#### *Symptoms in advanced pathology*

- Muscle pain during movement (Psora)
- Muscle spasms (Psora)
- Seizures (Psora)

#### *Aceruloplasminemia*

Aceruloplasminemia is a rare autosomal recessive disorder of iron metabolism characterized by a defect in the gene coding for ceruloplasmin.

- Main findings are late-onset retinal and basal ganglia degeneration, diabetes and neurological symptoms (Syphilis)

#### *Pathophysiology of aceruloplasminemia*

- There is slow accumulation of iron in tissues of pancreas, heart, kidney, spleen, and thyroid gland, basal ganglia, thalamus, and dentate nucleus (Psora/ Sycosis)
- Oxidase and immunoreactive ceruloplasmin are not detectable in serum of these individuals (Syphilis)
- The lack of cardinal copper-related symptoms in aceruloplasminemic individuals challenges what has been considered the essential role of ceruloplasmin in copper transport and homeostasis

#### *Albumin Christchurch disease*

- This is a rare type of alloalbuminemia
- It has a mutation in the gene that encodes the primary copper-binding site of plasma albumin (Syphilis)
- The albumin Christchurch has reduced ability to bind Cu ions compared with normal albumin (Psora)
- This leads to functional impairment in plasma capacity to transport ionic copper (Psora)
- Individuals with type I-A oculocutaneous albinism have mutations in the gene that encodes tyrosinase, a key copper-containing enzyme in the pathway of melanin (Syphilis)
- The melanin of pigmented tissues in retina and skin avidly bind copper, zinc and other metal ions

- Melanin is assumed as a major storage source for essential metals
- Subjects with oculocutaneous albinism lack tyrosinase activity (Psora)
- This deficiency is associated with an absence of melanin, which can seize and detoxify copper and other metals (Psora)
- This leads to oculocutaneous albinism patients for being prone to developing copper toxicosis (Psora/ Sycosis)

## Secondary disorders of copper metabolism

### Tyrolean infantile cirrhosis

- During 1900 and 1980, 138 infants and young children died in the Tyrolean area of western Austria from liver cirrhosis
- This condition was syndrome is called as Tyrolean infantile cirrhosis (TIC)
- It is an autosomal recessive disorder (Syphilis)
- Probable cause is using unpasteurized cow's milk with water heated for about 20 min in old copper pots (Causa occasionalis)
- Disappeared with the use of modern utensils

### Pathophysiology

- TIC is very difficult to distinguish among Indian childhood cirrhosis and other forms of hepatic copper toxicosis
- Copper cooking utensils were common in the Tyrolean area because of an extensive copper mining industry that was present until about 1926
- The syndrome appears due to combination of a genetic predisposition and a high intake of copper (Syphilis/ Causa occasionalis)

### Indian childhood cirrhosis

- Its etiology is similar to that of TIC
- It occurs in India in infants and very young children who are fed on milk stored in brass or copper flasks (Causa occasionalis)
- Once storage of milk in copper and brass containers is reduced, the disease begins to disappear
- As with TIC, the liver disease in ICC might be due to genetic abnormalities in copper metabolism and a high copper intake (Syphilis/ Causa occasionalis)

### Idiopathic copper toxicosis

- ICT is also called as-
  - ICC-like cirrhosis
  - Copper-associated childhood cirrhosis
  - Copper-associated liver disease in childhood
- It mostly affects infants or very young children, but some are children up to 10 years of age
- Increased ingestion of copper and consanguinity of parents or involvement of more than one sibling is often seen (Causa occasionalis)
- A combination of an autosomal recessive inherited defect in copper metabolism and excess copper intake lead to this condition (Syphilis/ Causa occasionalis)
- The source of excess copper appears to have been drinking water (Causa occasionalis)

## Disease-induced changes in copper homeostasis

- There are several environmental and physiological conditions that can disturb copper metabolism and thereby alter the delivery of copper to select tissues (Causa occasionalis). These include-
  - Exercise
  - Infection
  - Inflammation
  - Cirrhosis
  - Diabetes
  - Hypertension
- In all above conditions, a common finding is hypercupremia (Psora/ Sycosis)
- Hypercupremia is due to high concentrations of plasma ceruloplasmin (Psora/ Sycosis)
- Plasma ceruloplasmin increases due to its synthesis in the liver (Psora/ Sycosis)
- An increase in ceruloplasmin synthesis represents acute-phase response (Psora)
- This response is triggered by cytokines and hormones released in response to tissue injury (Psora)
- Although the acute-phase response is usually transitory, it can persist for long periods if tissue injury is continuous (Psora)
- Hypercupremia is a risk factor for cardiovascular disease and for some cancers (Causa occasionalis)
- Persistent hypercupremia represents oxidative reactions issues (Psora)
- An increase in DNA damage, secondary to copper-induced oxidative stress, could present a carcinogenic risk (Syphilis)
- An increase in oxidative stress could result in an increased risk for some forms of cardiovascular disease (Psora)

## Treatment

### Homoeopathic treatment

Though, the symptoms of copper homeostasis misbalance are quite wide, the complete repertory may be used. The major signs and symptoms, which strikingly indicate copper imbalance, can however, be collected and made ready for emergency reference.

### Common remedies for Copper homeostasis

abel. abrot. absin. acal. **Acet-ac.** acetan. acon-l. **ACON.** adon. aesc. **AETH.** agar-ph. **AGAR.** Agn. alco. **All-c.** all-s. allox. **Aloe** alum-p. alum-sil. **Alum.** alumn. am-be. am-c. **Am-m.** **Ambr.** **ANAC.** anan. anders. **ANG.** anh. **ANT-C.** ant-i. **Ant-t.** **Antip.** **APIS** Apoc. aran-sc. **Arg-met.** **ARG-N.** Arn. ars-h. ars-i. ars-s-f. **ARS.** Art-v. arum-t. arund. **Asaf.** Asar. astac. atro. aur-i. Aur-m-n. Aur-m. aur-s. **AUR.** Bac. bapt. **Bar-c.** **Bar-m.** barbit. **BELL.** **Benz-ac.** Berb. bism. blatta-a. **Borx.** **BOV.** brom. Bry. bufo but-ac. buth-a. cact. cadm-s. cain. calc-act. calc-ar. **CALC-P.** **CALC-S.** calc-sil. **CALC.** calen. **Camph-mbr.** camph. cann-i. **Cann-s.** **Canth.** **CAPS.** carb-ac. **Carb-an.** **Carb-v.** carbn-o. **Carbn-s.** **Carc.** **CARD-M.** carl. cas-s. **Castm.** **Caust.** cean. cedr. cench. cerstig-w. **CHAM.** **CHEL.** chelo. chen-a. chim. **CHIN.** **Chinin-ar.** **CHION.** chlol. chlor. chlorpr. cho. chol. **Cic.** cimic. **CINA** clem. cob. coca **Cocc.** **Coff.** **Colch.** **COLOC.** colos. **Com.** **CON.** conin. convo-s. cor-r. corn-f. **Corn.** cortico. cortiso. crat. **Croc.** **CROT-H.** **Crot-t.** **Cupr-act.** **CUPR.** cur. cycl. cyn-d. cypr. daph. **DIG.** **Dios.** diosm. **Dol.** **Dros.** **Dulc.** elaps elat. epiph. eucal. euon. eup-per. euph. **Euphr.** fab. fel ferr-ar. ferr-i. ferr-pic. **FERR.** fl-ac. **Form.** formal. gamb. gels. **Glon.** gnaph. gran. **GRAPH.** grat. **GUAJ.** guare. **Guat.** halo. hed. **HELL.** **Hep.** hier-p. hip-ac. **Hydr-ac.** **Hydr.** **Hyos.** hypoth. **IGN.** ilx-a. ing. ins. **IOD.** iodof. **IP.** **Iris** **JAB.** jal. **Jug-c.** kali-ar. **Kali-bi.** **Kali-br.** **Kali-c.** kali-chl. kali-i. kali-m. kali-n. kali-p. kali-perm. **Kali-pic.** kali-s. kali-sil. **Kreos.** lac-ac. lac-c. lac-d. **LACH.** lachn. lact. lat-m. **Laur.** led. **Lept.** lil-t. lina. lipp.

Lith-c. Lob. Lol. loxo-recl. **LYC.** lycps-v. lyss. M-ambo. m-arct. m-aust. Mag-c. **MAG-M.** Mag-p. mag-s. Manc. mand. mang-act. mang. med. Meli. meny. Merc-c. merc-cy. merc-d. merc-i-r. **MERC.** Mez. mim-p. morph. mosch. **Mur-ac.** muru. muscin. myric. naja narc-ps. nast-o. nat-ar. **Nat-c.** nat-ch. nat-f. **Nat-m.** nat-p. **NAT-S.** nicc-s. **NIT-AC.** Nit-m-ac. **NUX-M.** **NUX-V.** Oena. ol-an. **OLND.** onos. Op. ost. Par. paull. Petr. Ph-ac. phel. **PHOS.** phys. phyt. Pic-ac. Pilo. pin-s. pitu-p. plan. **PLAT.** plb-act. plb-xyz. **PLB.** **PODO.** prun. **PSOR.** Ptel. **PULS.** pulx. quas. rad-br. **Ran-b.** ran-s. raph. rat. **RHEUM** rhod. **RHUS-T.** ric. rubu. rumx. ruta sabad. sabin. samb. Sang. sanic. Santin. sabin. saroth. **SARS.** scler. scor. scut. Sec. sel. senec. Seneg. senn. **SEP.** sil. Spig. Spong. **SQUIL.** Stann. Staph. still. **STRAM.** stront-c. **SUL-AC.** sul-i. sulfa. **SULPH.** Sumb. Syph. Tab. tarax. tarent. tart-ac. ter. tetox. Teucr. Thuj. thym-gl. Thyr. til. Trif-p. trinit. Tub. urea Valer. verat-v. Verat. Verb. vib. viol-o. viol-t. vip. wies. xan. yohim. Yuc. zinc-p. zinc-s. **Zinc-val.** **ZINC.** ziz.

Short repertory of Copper homeostasis

ABDOMEN - CIRRHOSIS of liver am-be. ars-i. ars. Aur-m-n. aur-m. aur. calc-ar. Card-m. cas-s. chin. chlorpr. crot-h. **Cupr.** cur. diosm. dulc. euon. Hep. Hydr. iod. kali-bi. kali-i. lact. lyc. mag-m. merc-d. merc. **Mur-ac.** nast-o. nux-v. Phos. plb. quas. Sulph. urea vip.

ABDOMEN - HERNIA; ABDOMINAL - Inguinal - children; in **AUR.** **BELL.** calc. cham. cina cocc. lyc. mag-m. Nit-ac. nux-v. psor. sil. sul-ac. sulph. thuj. verat.

ABDOMEN - HERNIA; ABDOMINAL – Inguinal **Acon.** aesc. All-c. Alum. am-c. Am-m. anac. ant-c. **Apis** arg-met. Asar. Aur. **BELL.** berb. Bry. calc-ar. Calc. camph. cann-s. caps. Carb-an. Carb-v. cham. chin. clem. Cocc. coff. colch. coloc. dig. euph. gran. graph. **GUAJ.** hell. ign. ip. kali-c. kali-n. lach. **LYC.** m-ambo. M-arct. m-aust. Mag-c. merc. mez. **Mur-ac.** nat-m. Nit-ac. **NUX-V.** Op. petr. ph-ac. phos. plat. Plb. prun. psor. puls. rheum **Rhus-t.** sars. sec. sep. Sil. Spig. spong. stann. staph. stram. stront-c. Sul-ac. Sulph. ter. teucr. thuj. Verat. wies. Zinc.

EXTREMITIES – AWKWARDNESS aeth. **AGAR.** alum-sil. ambr. anac. **APIS** arg-n. ars. asaf. asar. bar-c. bell. **BOV.** bry. bufo calc-s. calc-sil. **CALC.** camph. Caps. carb-v. Caust. chin. cocc. Con. dig. euphr. gels. **HELL.** hep. Ign. IP. kali-bi. kali-c. kali-chl. **LACH.** Lol. loxo-recl. lyc. lyss. mag-p. med. mez. nat-ar. **Nat-c.** **Nat-m.** nat-s. **Nux-v.** op. ph-ac. phos. plb. Puls. Rheum ruta sabad. sabin. sars. sep. sil. spong. stann. staph. stram. sulph. thuj. verat-v. vip.

GENERALS - CHRONIC FATIGUE Syndrome am-c. ant-c. arg-met. arg-n. atro. aur. bapt. berb. brom. calc-p. calc. camph. cann-i. carb-v. carc. chin. cocc. coff. ferr. gels. ign. kali-p. lyc. mag-c. mag-m. **Mur-ac.** nat-m. nux-v. onos. op. ph-ac. phos. Pic-ac. scut. sel. sep. sil. Stann. sulph. thuj.

GENERALS - CONVULSIONS - children; in - infants, in absin. acon. Aeth. Art-v. Bell. bufo calc. Camph-mbr. caust. Cham. chlol. Cic. Cina cocc. Coff. Cupr. cypr. glon. **HELL.** Hydr-ac. Hyos. **IGN.** Ip. Kali-br. kreos. lach. laur. Mag-p. Meli. Merc. mosch. nux-v. Oena. Op. Santin. scut. stann. Stram. sulph. zinc-s. Zinc.

GENERALS - CONVULSIONS - children; in – newborns Art-v. bell. Cupr. nux-v.

GENERALS - COPPER - fumes agg. camph. Ip. lyc. Merc. nux-v. op. Puls.

GENERALS - COPPER - vessels of copper agg. hep.

GENERALS - DEVELOPMENT – arrested Agar. aloe ant-c. Bar-c. borx. bufo **CALC-P.** Calc. Carc. cupr. hypoth. kreos. lyc. nat-m. ol-an. Phos. rad-br. Sil. sulfa. thym-gl. thyr. tub. vip.

GENERALS - DEVELOPMENT – slow bac. bar-c. bufo calc-p. Calc. caust. cupr. kreos. lac-d. mag-m. med. nat-m. pin-s. sil. sulph. thyr.



GENERALS - GROWTH - complaints of growth process bar-c. calc-p. calc. ph-ac. phos. sil. **Thyr.**

GENERALS – HYPOTHERMIA acetan. ant-t. **Antip.** arg-n. ars-h. **Ars.** cact. chlor. cupr-act. eucal. kali-bi. kali-br. kali-p. lycps-v.

GENERALS – OSTEOPOROSIS cortico. cortiso. fl-ac.

GENERALS - PAIN - Muscles – cramping abrot. acon. agar. alum. am-c. am-m. **Ambr.** **ANAC.** **ANG.** **Ant-t.** arg-met. **Arn.** **Ars.** **Asaf.** asar. aur. bar-c. **BELL.** bism. bov. bry. bufo **CALC.** camph. **Cann-s.** canth. caps. carb-an. carb-v. carbn-s. **Castm.** **Caust.** cham. **Chel.** chin. cho. cic. cemic. **CINA** clem. **Cocc.** coff. colch. **COLOC.** **Con.** conin. croc. **Cupr-act.** **CUPR.** dig. **Dios.** dros. **Dulc.** euph. **Euphr.** ferr. gels. **Glon.** **Graph.** hell. hep. hyos. **Ign.** iod. ip. **Iris** jab. **Kali-br.** **Kali-c.** kali-n. kreos. lach. lat-m. laur. **LYC.** m-ambo. **M-arct.** mag-c. **Mag-m.** **Mag-p.** mang. meny. **MERC.** mez. morph. mosch. **Mur-ac.** nat-c. nat-m. **Nit-ac.** nux-m. **NUX-V.** olnd. **Op.** par. **Petr.** ph-ac. phos. phyt. **PLAT.** plb-act. **Plb.** puls. ran-b. ran-s. rhod. **Rhus-t.** ruta sabad. samb. sang. **Sec.** **SEP.** **SIL.** **Spig.** **Spong.** squil. **Stann.** staph. stram. stront-c. **SUL-AC.** **SULPH.** syph. **Tab.** tetox. **Thuj.** trinit. **Valer.** verat. **Verb.** vib. viol-o. viol-t. zinc.

GENERALS - SWELLING - puffy, edematous **Acet-ac.** **Acon.** **Agar.** am-c. **Am-m.** **ANT-C.** antip. **APIS** Apoc. arn. ars-i. ars-s-f. **ARS.** **Asaf.** **Aur-m.** aur. bar-c. **Bell.** bov. **Bry.** cain. calc-sil. **CALC.** canth. **CAPS.** **Carbn-s.** card-m. cedr. cham. chin. cina cocc. colch. coloc. **Com.** con. crat. **CUPR.** **DIG.** dros. **Dulc.** ferr-ar. **FERR.** **GRAPH.** guaj. **HELL.** hyos. **Iod.** ip. kali-br. kali-c. kali-i. kreos. lach. laur. led. **Lith-c.** **Lyc.** mag-c. med. merc. mez. mosch. naja nat-c. **Nat-m.** **Nit-ac.** nux-m. nux-v. **OLND.** op. phos. **Phyt.** plb. puls. rheum **Rhus-t.** sabin. samb. sars. **Seneg.** **Sep.** sil. **Spig.** spong. **SQUIL.** staph. stram. stront-c. **Sulph.** ter. **Teucr.** thyr. til. verat. **Verb.** zinc. ziz.

HEAD - HAIR - curly, becomes mez.

HEAD - PAIN - copper, abuse of hep.

MIND - DULLNESS - children, in aeth. **Agar.** **ARG-N.** **BAR-C.** **Bar-m.** bufo **CALC-P.** calc-s. **Calc.** carb-v. **Carbn-s.** carc. caust. cupr. graph. iod. kali-sil. lach. **Lyc.** med. merc. nat-s. phos. sep. **Sil.** **SULPH.** **Syph.** **Tub.** zinc.

MIND - MOOD – changeable acon-l. **Acon.** agar. agn. alco. aloe alum-p. alum-sil. **Alum.** ambr. anac. anan. ang. anh. ant-t. **Apis** arg-met. **Arg-n.** arn. ars-h. ars-i. **Ars.** asaf. asar. aur-i. aur-m. aur-s. **Aur.** **Bar-c.** **Bell.** bism. **Borx.** bov. bry. bufo calc-s. calc-sil. **Calc.** camph-mbr. cann-i. cann-s. canth. caps. carb-an. carb-v. carbn-o. carbn-s. carl. castm. caust. cerstig-w. cham. **Chin.** cemic. cina cob. coca **Cocc.** **Coff.** con. cortico. **Croc.** **Cupr.** cur. cycl. **Dig.** dros. eup-per. ferr-ar. ferr-i. **Ferr.** gels. graph. guare. hyos. **IGN.** iod. ip. **Kali-c.** kali-p. kali-s. kali-sil. lac-c. lac-d. lach. lachn. led. lil-t. **LYC.** m-arct. m-aust. **Mag-c.** mang-act. med. meny. merc-c. **Merc.** mez. morph. mosch. mur-ac. nat-c. nat-m. nit-ac. **NUX-M.** op. **Petr.** phel. **Phos.** plan. **Plat.** plb. **Psor.** **PULS.** pulx. ran-b. rat. rheum sabad. sang. sanic. sapin. **SARS.** scler. senec. seneg. **Sep.** sil. spig. spong. **Stann.** **Staph.** **Stram.** **Sul-ac.** sul-i. sulph. **Sumb.** tarent. thuj. **Tub.** **Valer.** verat. verb. yuc. zinc-p. **Zinc-val.** **ZINC.** ziz.

MOUTH - SALIVATION – profuse abel. **Acet-ac.** acon. adon. agar. all-s. allox. **Alum.** am-c. am-m. **Ambr.** anac. ang. **Ant-c.** ant-t. apis aran-sc. **Arg-met.** arn. ars-s-f. ars. arum-t. asaf. asar. aur. bapt. **Bar-c.** **BELL.** bism. borx. bov. brom. bry. but-ac. buth-a. cadm-s. calc-sil. **Calc.** camph. cann-s. canth. caps. carb-ac. carb-an. carb-v. carbn-s. **Caust.** cench. **Cham.** chel. **Chin.** chion. cic. cina cocc. coff. **Colch.** con. croc. crot-h. cupr. cycl. cyn-d. daph. dig. **Dros.** **Dulc.** epiph. euph. ferr-ar. ferr. fl-ac. formal. glon. gran. **Graph.** guaj. halo. **Hell.** hep. hydr-ac. **Hyos.** **Ign.** **Iod.** **Ip.** **Iris** **JAB.** **Kali-br.** **Kali-c.** kali-chl. kali-i. kali-n. kali-perm. kreos. lac-ac. lac-c. **Lach.** lat-m. **Laur.** led. **Lob.** lyc. lyss. **M-ambo.** m-arct. m-aust. mag-c. **Mag-m.** **Manc.** mand. mang. meny. merc-c. merc-cy. merc-d. merc-i-r. merc. mez. mim-p. mur-ac. muru.

muscin. naja narc-ps. **Nat-c.** **Nat-m.** nicc-s. **Nit-ac.** **Nit-m-ac.** nux-m. **NUX-V.** olnd. op. **Par.** petr. ph-ac. phos. phys. phyt. **Pilo.** pitu-p. plat. plb. podo. ptel. **PULS.** **Ran-b.** ran-s. raph. rheum rhod. **RHUS-T.** sabad. sabin. samb. **Sang.** sars. scor. sec. sel. **Seneg.** **Sep.** **Sil.** **Spig.** spong. squil. stann. **Staph.** **Stram.** stront-c. **Sul-ac.** **Sulph.** syph. tab. tarax. tart-ac. teucr. thuj. **Trif-p.** valer. verat-v. **Verat.** verb. viol-t. xan. yohim. **Zinc.**

RECTUM - DIARRHEA - children; in – infants **Acon.** **Aeth.** apis **Arg-n.** **Ars.** arund. bapt. **Bell.** benz-ac. bism. **Borx.** calc-act. **Calc-p.** **Calc.** camph. **Cham.** chin. cina **Coloc.** colos. **Crot-t.** dulc. ferr. grat. **Hell.** hep. **Ip.** jal. kali-br. **Kreos.** laur. lyc. lyss. **Mag-c.** **Merc-c.** **Merc-d.** merc. nit-ac. **Nux-v.** paull. **Ph-ac.** phos. **Podo.** **Psor.** **Rheum** sabad. sep. **Sil.** sulph. valer. **Verat.**

RECTUM - DIARRHEA - children; in – newborns **Aeth.**

RECTUM - DIARRHEA - children; in – nurslings arund. calc-p. calc-s. cham. sep. **Sulph.** verat.

RECTUM - DIARRHEA - children; in **Acon.** **AETH.** **Agar.** **Agn.** aloe ant-c. apis **Arg-n.** **Ars.** arund. **Bac.** bar-c. **Benz-ac.** **Borx.** **Calc-p.** **CALC-S.** **CALC.** carb-v. carc. **CHAM.** chin. cimid. **Cina** **Crot-t.** **Dulc.** elat. **Ferr.** **Form.** gamb. gnaph. hell. **Hep.** hyos. ing. iod. iodof. **IP.** **Iris** jal. kreos. **Mag-c.** **MAG-M.** mag-s. med. **MERC.** **Mez.** **Mur-ac.** **Nat-m.** nux-m. **Nux-v.** olnd. ph-ac. **PHOS.** **PODO.** **PSOR.** **Puls.** **RHEUM** rubu. sabad. samb. senn. sep. **SIL.** stann. **Staph.** **STRAM.** sul-ac. **SULPH.** tub. **Valer.** **Verat.** zinc.

SKIN - DISCOLORATION – coppery carb-an. cor-r. merc. mez. nit-ac. **Rhus-t.** syph.

SKIN - DISCOLORATION – yellow acal. acetan. **ACON.** aesc. agar-ph. agar. agn. **Aloe** alum-p. alum. alumn. **Am-m.** **Ambr.** anders. **Ant-c.** ant-i. **Ant-t.** arg-n. **Arn.** ars-i. **Ars.** asaf. astac. aur-m-n. aur-s. **Aur.** barbit. **Bell.** **Berb.** blatta-a. bov. brom. **Bry.** bufo cadm-s. calc-ar. **Calc-p.** calc-s. calc-sil. **Calc.** calen. cann-s. **Canth.** **Carb-v.** carbn-s. **CARD-M.** cas-s. **Caust.** cean. cedr. **Cham.** **CHEL.** chelo. chen-a. chim. **CHIN.** **Chinin-ar.** **CHION.** chol. cina coca cocc. **CON.** convo-s. corn-f. **Corn.** croc. **CROT-H.** cupr. **Dig.** **Dol.** dulc. elaps elat. eup-per. euph. fab. fel ferr-ar. **Ferr-i.** ferr-pic. **Ferr.** fl-ac. gels. graph. **Guat.** hed. hell. **Hep.** hier-p. hip-ac. **Hydr.** **Ign.** ilx-a. ins. **IOD.** iris **Jug-c.** kali-ar. kali-bi. kali-c. kali-i. kali-m. kali-p. **Kali-pic.** kali-s. kali-sil. **LACH.** lact. laur. **Lept.** lina. lipp. **LYC.** mag-m. mag-s. mang-act. mang. med. **Merc-c.** merc-d. **MERC.** mur-ac. myric. nat-ar. nat-c. nat-ch. nat-f. **Nat-m.** nat-p. **NAT-S.** **NIT-AC.** **NUX-V.** olnd. **Op.** ost. petr. ph-ac. **PHOS.** pic-ac. plb-xyz. **PLB.** **Podo.** psor. **Ptel.** **Puls.** quas. ran-b. rheum rhus-t. ric. rumx. ruta sabad. **Sang.** saroth. **Sec.** **SEP.** **Sil.** **Spig.** still. sul-ac. sul-i. sulfa. **Sulph.** tab. tarax. tarent. ter. thuj. trinit. verat. vip. **Yuc.**

SKIN - ITCHING - jaundice; during **Dol.** **Hep.** myric. pic-ac. ran-b. thyr.

STOMACH - NAUSEA - jaundice; with bry. lach.

THROAT - DISCOLORATION - copper-colored **Kali-bi.** **MERC.**

Toxicity - COPPER, poisoning, cuprum, ailments from - copper, fumes, agg. camph. **Carb-v.** cupr. **Ip.** lyc. **Merc.** nux-v. op. **Puls.**

Toxicity - COPPER, poisoning, cuprum, ailments from - copper, vessels, agg. cupr. hep.

Toxicity - COPPER, poisoning, cuprum, ailments from bell. camph. **Cupr.** hep. **Ip.** lyc. **Merc.** nux-v. op. puls. sil. zinc.

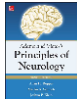
Toxicity - FUMES, gases, poisoning, toxic – copper camph. **Ip.** lyc. **Merc.** nux-v. op. **Puls.**

Toxicity - VAPORS, poisoning, ailments from – copper camph. **Ip.** lyc. **Merc.** nux-v. op. **Puls.**

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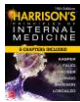
Chapter 130. Cutaneous Changes in Nutritional Disease > Copper and Menkes Disease  
Fitzpatrick's Dermatology in General Medicine, 8e



Chapter 37. Inherited Metabolic Diseases of the Nervous System > Menkes Disease (Kinky- or Steely-Hair Disease; Trichopoliodystrophy, ATP7A Mutation) Adams & Victor's Principles of Neurology, 10e.... A relationship between Wilson and Menkes disease is nonetheless evident at a genetic level as they arise from genes encoding two different copper-transporting proteins that are both ATPases. The situation, however, may be more complex, as samples of intestinal tissue show a buildup of copper that indicates...



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Hemochromatosis, Porphyrrias, and Wilson's Disease > WILSON'S DISEASE Harrison's Manual of Medicine, 19e ... Wilson's disease is a rare inherited disorder of copper metabolism, resulting in the toxic accumulation of copper in the liver, brain, and other organs. Individuals with Wilson's disease have mutations in the ATP7B gene, which encodes a membrane-bound copper-transporting adenosine...



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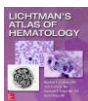
Liver, Biliary Tract, & Pancreas Disorders > WILSON DISEASE (HEPATOENTICULAR DEGENERATION) Current Medical Diagnosis & Treatment 2017



Nervous System Disorders > 7. Wilson Disease CURRENT Medical Diagnosis & Treatment 2017... In this metabolic disorder, abnormal movement and posture may occur with or without coexisting signs of liver involvement. Psychiatric and neuropsychological manifestations are common. Wilson disease is discussed in Chapter 16 . ...



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Radar 10