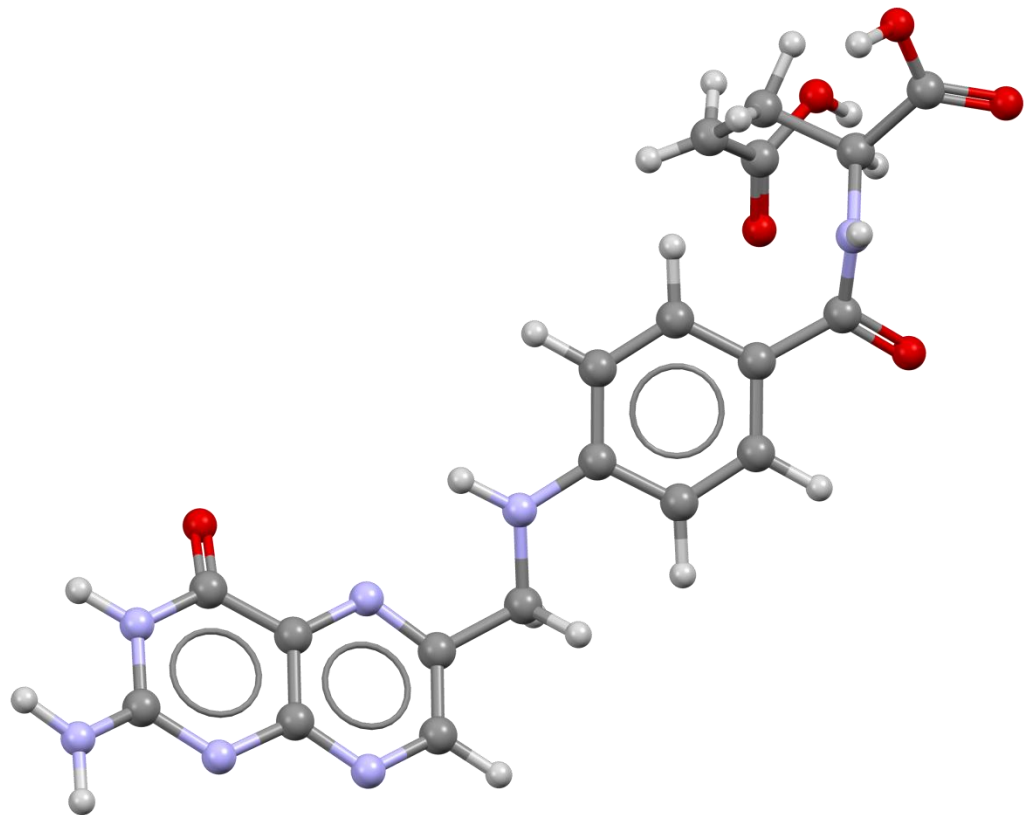


# Folic acid and Iodine in Pregnancy

Ramin Abrishami

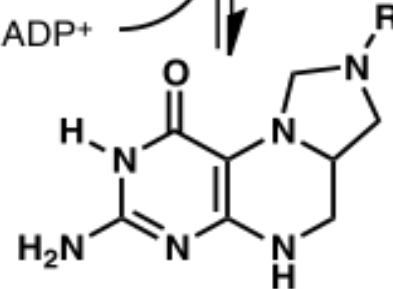
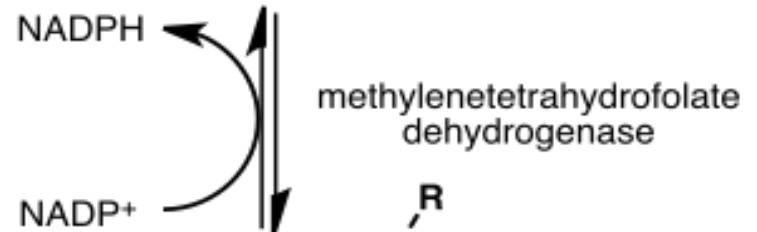
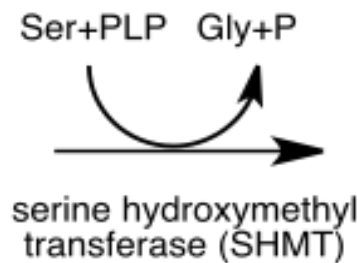
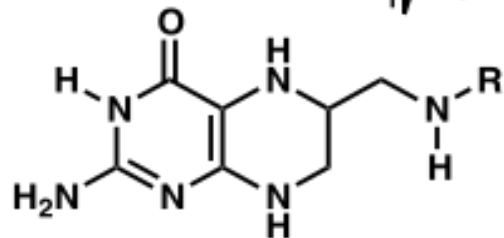
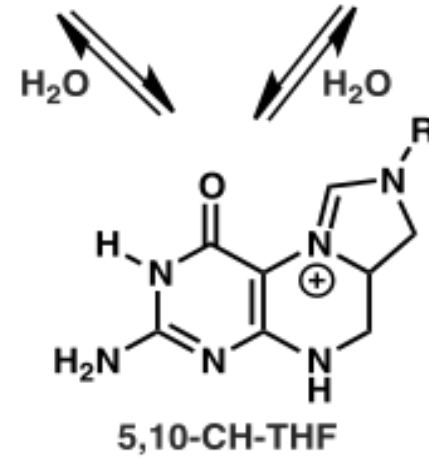
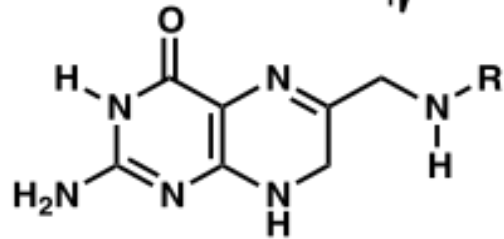
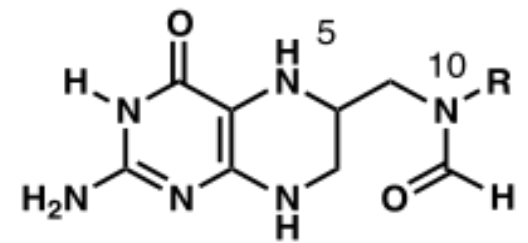
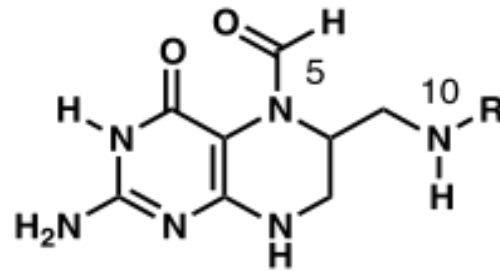
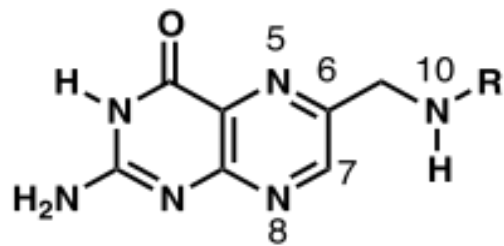
PharmD, Clinical Pharmacy Specialist

# FOLIC ACID



# Natural Sources

- Folate (B9) occurs naturally in several foods: beef liver, leafy vegetables, peas and beans, avocados, eggs, and milk



# DHFR mutations

- Causes dihydrofolate reductase deficiency
- Rare, autosomal recessive, described in 2011
- Results in megaloblastic anemia, pancytopenia and severe cerebral folate deficiency
- Folinic acid, a reduced form of folate, is used to correct the deficiency

# Absorption

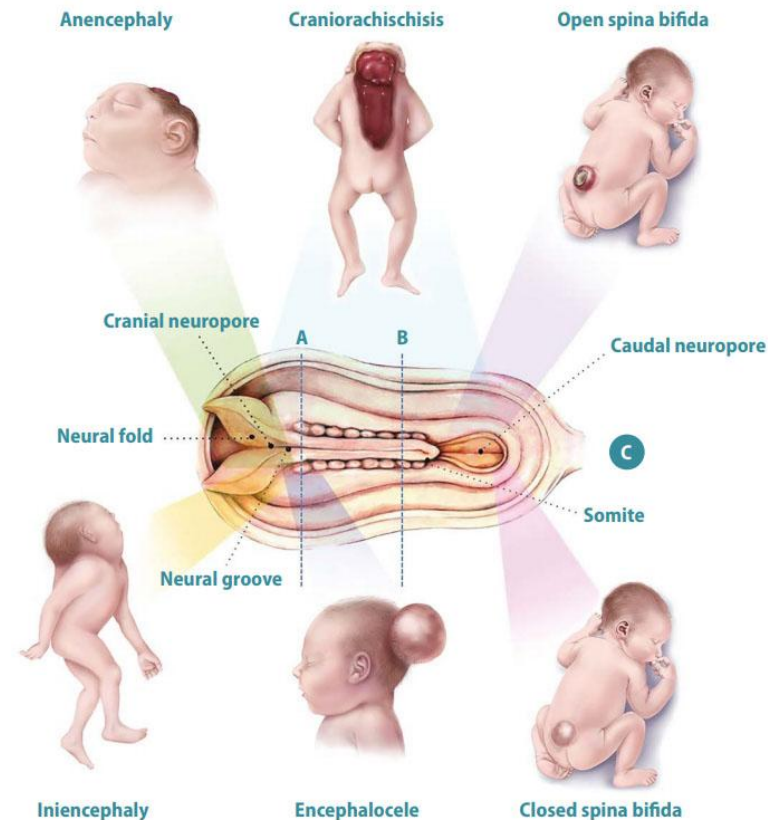
- Both folate and folic acid are reduced to their metabolically active form, L-5-methyl-THFL, during absorption across the intestinal mucosa

# Causes of suboptimal levels

- Decreased intake:
  - Low-carbohydrate from fortified grains diets
  - Food insecurity
  - Anorexia nervosa and other medical conditions affecting food intake
- Medications: phenytoin, sulfasalazine, trimethoprim, methotrexate
- Medical or surgical conditions associated with malabsorption: IBD and major intestinal resection or bypass; celiac disease, significant liver disease, ESRD, obesity, and ethanol abuse
- Methylene-tetrahydrofolate reductase polymorphisms

# Why supplementation?

- Folic acid decrease the occurrence and recurrence of neural tube defects by up to 93%





# Guidelines

- Most major national medical organizations and public health authorities recommend that all females of childbearing potential, not just those who are attempting to conceive, receive a once per day folic acid supplement

# راهنمای کشوری ارائه خدمات مامایی و زایمان

- **ید و فولیک اسید:**
  - از سه ماه پیش از بارداری
  - از ابتدای بارداری تا پایان بارداری
- **از شروع هفته ۱۶ بارداری:**
  - آهن المنتال ۱۳ میلی گرم
  - مولتی ویتامین مینرال روزانه یک قرص تا پایان بارداری

# Dose

- For most females: 0.4 mg once per day
- Begin at least one month prior to attempting conception and continuing throughout pregnancy and for 4~6 weeks postpartum or until completion of breastfeeding
- Some guidelines recommend beginning 2~3 months before conception

# Females at high risk

- Those with a previous fetus with an NTD are candidates for higher dose (1~4 mg/d)
- This dose should be initiated 1~3months prior to conception and maintained through the first 12 weeks of gestation, after which the dose is reduced to 0.4 mg

# Anti-seizure medications

- Valproic acid or carbamazepine: change to another regimen if possible or receive 4 mg/d periconceptual/first-trimester folic acid
- Other anti-seizure medications: 0.4 mg/d folic acid

# Other diseases

- 1 mg/d: celiac disease, IBD, major intestinal resection or bypass, advanced liver disease, ESRD, preexisting diabetes, and unhealthy alcohol use

# IODINE

ATOMIC NUMBER — 26<sup>+2</sup><sub>+3</sub>

SYMBOL — Fe

NAME — Iron  
55.845

**STATE OF MATTER**  
GAS LIQUID ARTIFICIAL

- HYDROGEN
- ALKALI METALS
- ALKALINE-EARTH METALS
- TRANSITION METALS
- OTHER METALS

B Boron 10.811	C Carbon 12.011	N Nitrogen 14.007	O Oxygen 15.999	F Fluorine 18.998	Ne Neon 20.179
13 Al Aluminium 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.06	17 Cl Chlorine 35.45	18 Ar Argon 39.948
31 Ga Gallium 69.723	32 Ge Germanium 72.64	33 As Arsenic 74.922	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.8
49 In Indium 114.82	50 Sn Tin 118.71	51 Sb Antimony 121.76	52 Te Tellurium 127.6	53 I Iodine 126.9	54 Xe Xenon 131.3
81 Tl Thallium 204.38	82 Pb Lead 207.2	83 Bi Bismuth 208.98	84 Po Polonium 209	85 At Astatine 210	86 Rn Radon 222
113 Uut Ununtrium (284)	114 Uuq Ununquadium (289)	115 Uup Ununpentium (288)	116 Uuq Ununhexium (289)	117 Uuh Ununheptium (288)	118 Uuo Ununoctium (294)

# Iran

- Iodine deficiency had been identified in Iran since 1968
- National survey → The iodine intake of school children is sufficient, however, Iranian pregnant women are suffering from moderate iodine deficiency and need iodine supplementation.



# Guidelines

- Deficiency → maternal and fetal/neonatal hypothyroidism
- WHO: 250 mcg/d for pregnancy and lactation
- Pregnant women should be encouraged to use iodized salt and/or seafood
- Cochrane: insufficient data on the benefits/harms of routine I supplementation pre-conception, during pregnancy, or postpartum
- Many prenatal vitamins contain no iodine
- Excessive intake can cause fetal goiter

# فرآورده های ید و فولیک اسید

- یدوفولیک (درسآدارو): ۵۰۰ میکروگرم اسید فولیک و ۱۵۰ میکروگرم ید
- ید + فولیک اسید (امین): ید ۱۵۰ میکروگرم و فولیک اسید ۵۰۰ میکروگرم
- ویتاویل ید فولیک و دی ۳ (مهبان دارو): ید ۱۵۰ میکروگرم، فولیک اسید ۵۰۰ میکروگرم و ۱۰۰۰ واحد ویتامین د
- و بسیاری برندهای دیگر...

# Which preparation?

- In healthy volunteers, folic acid supplements, dietary folate, and L-5-methyl-THFL → similar increases in plasma folate and RBC folate concentrations

# Which preparation?

- Review: Supplementation with 5-MTHF in pregnancy is preferable than folic acid in **certain** conditions, because it does not require metabolic activation...

