



What Pharmacy Technicians Should Know About Vitamin Therapy

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Speaker Disclosure: Tom Flench has no actual or potential conflicts of interest in relation to this program



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What Pharmacy Technicians Should Know About Vitamin Therapy

Accreditation:

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Target Audience: Technicians

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Program Overview: The topic of vitamins of various types has caught the public's attention for the last several decades. This knowledge based webinar will review the basic information about vitamins for the pharmacy technician. Science has only recently begun studies examining the potential positive effects of vitamin supplementation. Science has only recently begun studies examining the potential positive effects of vitamin supplementation. This webinar will review the basic information about vitamins for the pharmacy technician

Objectives:

- Identify the various types of currently available vitamins
- Explain “natural” sources of vitamins and their uses
- Describe the symptoms of known vitamin deficiencies
- Describe vitamin options specific to adults
- Explain several uses of vitamins in geriatric patients
- List specialty uses associated with vitamins

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Learning Objectives

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Vitamin Definition

- Are organic substances necessary for metabolic functioning
 - Found in well rounded diets
 - Inadequate diet may lead to deficiencies
- Fat Soluble vs. Water Soluble Vitamins
 - Sources
 - Uses

Fat-Soluble Vitamins [1]

- Vitamin A

normal growth, bone formation, retinal function, reproductive function

keratomalacia- vitamin A deficiency

- causes softening of the cornea

source

- milk, butter, cheese, liver, fish oils



Fat-Soluble Vitamins [1]

- Vitamin D

calcium and phosphate balance

rickets- vitamin D deficiency

causes bending of the bones

sources- butter, cheese, milk, egg yolk, fish



Fat-Soluble Vitamins [1]

- Vitamin E

- antioxidant for unsaturated fatty acids

vitamin E deficiency is very rare

sources

- soybean oil, wheat germ, rice germ, cottonseed, nuts, corn, butter, eggs, liver, leafy green vegetables



Fat-Soluble Vitamins [1]

- Vitamin K – (phytonadione).
 - plays a role in blood clotting
 - vitamin K deficiency is rare in healthy adults
 - sources- soybeans, green leafy vegetables (spinach, cabbage, cauliflower, collards, broccoli, and brussel sprouts); and fruits (avocado and kiwi)



Water-Soluble Vitamins- C

- Vitamin C (ascorbic acid)
 - has anti-inflammatory activity, promotes wound healing
- scurvy- vitamin C deficiency
 - causes anemia, and leg muscle problems
- sources- green plants, tomatoes, citrus fruits (oranges, lemon, grapefruit), potatoes





Water-Soluble Vitamins- B

- All B vitamins are water soluble, meaning they are dispersed throughout the body (made up of 70% water) ^[1]
- Most of the B vitamins must be replenished daily, the excesses are excreted in the urine. ^[1]



Water soluble Vitamins

- **Vitamin B₁** -thiamine
- **Vitamin B₂** -riboflavin
- **Vitamin B₃** -niacin
- **Vitamin B₅** -pantothenic acid
- **Vitamin B₆** -pyridoxine
- **Vitamin B₇** -biotin
- **Vitamin B₉** -folic acid
- **Vitamin B₁₂** -cyanocobalamin

Sources of Water soluble Vitamins

- For all B's are....
- Meats
 - pork, liver, beef, heart, kidney
- Cereals
 - rice, wheat
- Vegetables
 - peas, green beans, potatoes
- Beans



Water soluble Vitamins- Deficiencies ^[1]

- **B₁** – weakness and pain in the limbs
- **B₂** – Cracks in the lips, sensitivity to sunlight
- **B₃** – pellagra (skin rashes, mouth sores, diarrhea, mental deterioration)
- **B₅** – acne, and paresthesia (sensation of tingling, pricking, or numbness of the skin)
- **B₆** – anemia, depression, dermatitis
- **B₇** – impaired growth disorders in infants
- **B₉** – anemia, brain aging effects, birth defects during pregnancy
- **B₁₂** - cognitive deficits (memory loss), anemia, mania (mood elevation)



Water-Soluble Vitamins

- Vitamin B₁-(thiamine) - used in carbohydrate metabolism
- Vitamin B₂-(riboflavin) - maintains metabolic energy pathways
- Vitamin B₃-(nicotinic acid, niacin) - involved in fat synthesis and protein metabolism
- Vitamin B₅-(pantothenic acid) - used in carbohydrate metabolism
- Vitamin B₆-(pyridoxine) - maintains metabolic energy pathways
- Vitamin B₇-(biotin) - involved in fat synthesis and protein metabolism



Water-Soluble Vitamins

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 - used in carbohydrate metabolism
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 - involved in fat synthesis and protein metabolism



Water-Soluble Vitamins

- Vitamin B₉ (folic acid)
 - production of healthy red blood cells and decreases the risk of birth defects
- Vitamin B₁₂ (cyanocobalamin)
 - production of red blood cells



Enteral Nutrition [2]

- Patients are fed through a tube leading to the GI system
- Preferred method over IV therapy
- Very important to label enteral nutrition properly to avoid mix-ups with parenteral nutrition




Total Parenteral Nutrition [2]

- Patient is fed through a vein
- Can be lifesaving, but can be devastating if appropriate precautions are not taken
- All additives must be carefully calculated, then recalculated for accuracy



Malnutrition [2]

- Undernourished individual
 - Poor dietary intake of essential nutrients
- Heals poorly
- Gets more infections
- Need a certain % of body fat
 - Energy needs
- Causes organ failure
 - Cardio, Renal, GI



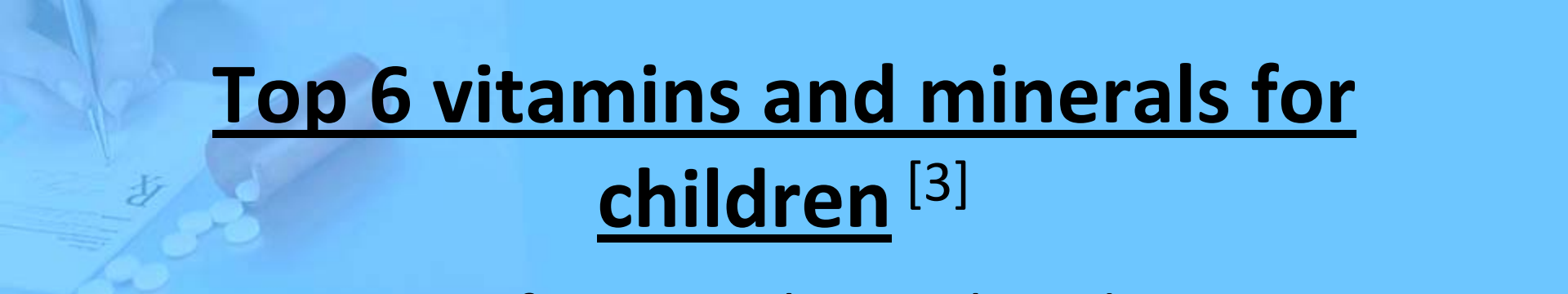
Recommended Multivitamin Additions for TPN ^[2]

- ascorbic acid (vitamin C)
- biotin
- cyanocobalamin (vitamin B₁₂)
- ergocalciferol (vitamin D₂)
- folic acid (vitamin B₉)
- niacin (vitamin B₃)
- pyridoxine (vitamin B₆)
- retinol (vitamin A)
- riboflavin (vitamin B₂)
- thiamine (vitamin B₁)
- tocopherol (vitamin E)



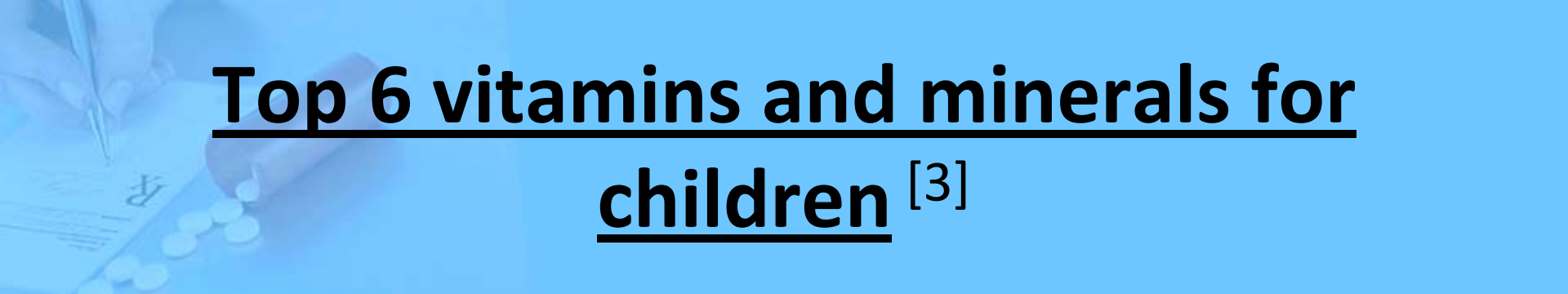
Vitamins for children [3]

- Children should get their vitamins from a balanced, healthy diet that includes:
 1. milk and dairy products (cheese and yogurt)
 2. fresh fruits and leafy, green vegetables
 3. protein: chicken, fish, meat, and eggs
 4. whole grains: oatmeal and brown rice



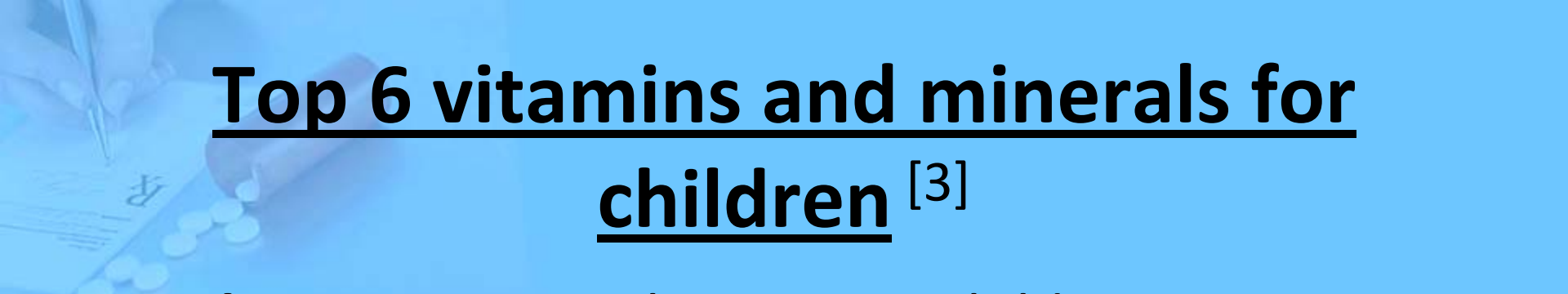
Top 6 vitamins and minerals for children ^[3]

- **Vitamin A**for normal growth and development; tissue and bone repair; and healthy skin, eyes, and immune responses.
 - Healthy sources = milk, cheese, eggs, and yellow/orange vegetables (carrots, yams, and squash).
- **Vitamin B**.....B2, B3, B6, and B12 for better children's metabolism, energy production, and healthy circulatory and nervous systems.
 - Healthy sources = meat, chicken, fish, nuts, eggs, milk, cheese, beans, and soybeans.



Top 6 vitamins and minerals for children ^[3]

- **Vitamin C** healthy muscles, connective tissue, and skin.
 - Healthy sources = citrus fruit, strawberries, tomatoes, and green vegetables.
- **Vitamin D** bone and tooth formation and helps the body absorb calcium.
 - Healthy sources = milk, cheese, yogurt.



Top 6 vitamins and minerals for children ^[3]

- **Calcium**strong bones as a child grows.
 - Healthy sources = milk, cheese, yogurt, tofu, and calcium-fortified orange juice.

- **Iron**builds muscle and is essential to healthy red blood cells. Iron deficiency is a risk in adolescence, especially for girls once they begin to menstruate.
 - Healthy sources = beef and other red meats, turkey, pork, spinach, beans, and prunes.



Vitamins for children [3]

1. Unless a doctor advises differently, wait until around age 4.
2. Use chewable vitamins.
3. Check with a pharmacist for drug interactions with any current meds the child is taking.
4. Give after meals.
5. Keep vitamins out of reach of children.



Vitamins for children

1. Yummi Bears Vitamin C
2. Rhino Beanie Vites
3. L'il Critters Gummy Vites
4. Centrum Kids Complete Multivitamin /
Multimineral
5. Flintstones Children's
Multivitamin/Multimineral
6. Various generic equivalents by pharmacy*

A hand is writing on a prescription form with a pen. Next to it is a brown pill bottle that has tipped over, spilling several white, round pills onto a light-colored surface.

Vitamins for adults

- prenatal vitamins...mandatory during pregnancy
- Rx or OTC....difference is in folic acid content



Vitamins for adults

once a day vitamins...adults

start when you are a young adult

sports

environment

health issues



Vitamins for adults

- vitamins and minerals...adults
 - around the age of 35 and above when diet starts to become issue

- vitamins and minerals...adult seniors
 - eye sight
 - memory
 - etc.



Vitamins for adults

- vitamin c...seasonal (multiple sources)
- cough & cold season
 - tablets (swallow or chewable)
 - juice sources
 - daily needs



Vitamins used for.....what?!?!?!?

- Hair loss
- Energy
- Skin
- Weight control
- Acne
- Depression
- Memory
- Sleep

A hand is writing on a prescription slip with a pen. Next to it is a spilled pill bottle with several white pills scattered on the surface.

Hair vitamins

- Niacin (vitamin B-3) promotes blood circulation to your scalp.
- Panthenol (vitamin B-5) may stop hair loss.
- Biotin can also prevent hair from graying prematurely.
- Vitamins B-6 and B-12 have been shown to play a role in healthy hair growth.

vitamins-minerals.suite101



Vitamin B : The Energy Vitamin

- Thiamine (B1)
- Riboflavin (B2)
- Niacin (B3)
- Pyridoxine (B6)
- Folic acid (B9)
- Cyanocobalamin (B12)
- Pantothenic acid (D-Calcium)



Vitamins - For healthy skin

- Vitamin A
- Vitamin B
- Vitamin C
- Vitamin E

Vitamins for Weight Control

- Riboflavin (B2)
- Niacin (B3)
- Pyridoxine (B6)

A hand is writing on a prescription slip with a pen. Next to it is a spilled pill bottle with several white pills scattered on the surface.

Vitamins for Acne

- Vitamin B complex
- Vitamin C
- Vitamin E
- Zinc, chromium, and Vitamin C

A hand is writing on a prescription slip with a pen. Next to it is a spilled pill bottle with several white pills scattered on the surface.

Vitamins for Depression

- Vitamin B complex

Vitamins to Improve Memory

- Vitamin B complex
- Vitamin C
- Vitamin E



Conclusion

- prenatal vitamins...mandatory during pregnancy
- once a day vitamins...children & adults
- vitamins and minerals...adults
- vitamins and minerals...adult seniors
- vitamin c...seasonal (multiple sources)



QUESTIONS



References

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