ACPE UAN 0107-0000-10-023-L01-P  0.1 CEU/1.0 Hr.
Activity Type: Application-Based

Program Objectives for Pharmacists: Upon completion of this program, participants should be able to:
1. Describe the common types of risks and benefits of dietary supplements used for the treatment or prevention of cancer or for the alleviation of side effects of prescription cancer treatments.
2. Name two commonly used dietary supplements in each category: treatment, prevention, alleviation of side effects of other treatments.
3. Describe the extent of clinical evidence available for each of the above-named supplements.
4. Name one dietary supplement for cancer treatment with clear clinical evidence that it is NOT effective.
5. Name two reliable dietary supplement information resources.

Speaker: Cydney McQueen, PharmD, is an Associate Clinical Professor, Pharmacy Practice and Administration, at the University of Missouri-Kansas City School of Pharmacy. She completed a two-year fellowship in natural product research at UMKC and specializes in evidence-based dietary supplement information. Teaching responsibilities focus on evidence-based therapeutic use of dietary supplements, sterile and non-sterile compounding, patient counseling, and self-care.

Dr. McQueen is a contributor/reviewer on dietary supplement and complementary and alternative medicine topics for several references, pharmacy textbooks, and professional journals. She has edited Sigler’s Dietary Supplement Drug Cards and Pharmaceutical Care with Dietary Supplements: Concepts and Common Sense, a textbook on appropriate therapeutic use of dietary supplements. She has contributed to chapters on herbal and non-herbal supplements for several editions of the Handbook of Nonprescription Drugs as well as to various books on evidence-based medicine and drug information. Specific areas of interest include development of educational materials, evaluation of dietary supplement information resource quality, and adverse event and interaction analysis and reporting.

Speaker Disclosure: Cydney McQueen reports she has no actual or potential conflicts of interest in relation to this program. The speaker has indicated that off-label use of medications will not be discussed during this presentation.
1. Of the types of risk/benefit combinations for DS, which has the greatest potential for patient harm?

   A. Doesn’t work
   B. Doesn’t work; interferes with other therapies
   C. Works; has ADEs
   D. Works, interferes with other therapies
   E. None of the above
   F. All have equal potential for harm

2. Which of the following pairs are both more commonly used for alleviation of side effects of other treatments than for treatment?

   A. Baikul skullcap; melatonin
   B. Vitamin C; coenzyme Q10
   C. Shark cartilage; vitamin E
   D. Coenzyme Q10; turmeric
   E. Turmeric; vitamin C

3. Which of the following does not have sufficient evidence to be considered proven to be an ineffective cancer treatment?

   A. Vitamin C
   B. Hydrazine sulfate
   C. Neovastat
   D. Shark cartilage
   E. All of the above

4. More clinical research exists for DS treatments for cancer than for adjunctive use with other therapies.

   A. True
   B. False

5. Which of the sites below is not considered a reliable resource for DS information?

   A. www.naturaldatabase.com
   B. www.naturalstandard.com
   C. www.propax.com
   D. www.mskcc.org
   E. All of the above are reliable
Types of Dietary Supplement Risks and Benefits

Cydney E. McQueen, Pharm.D.
Clinical Associate Professor
University of Missouri-Kansas City
School of Pharmacy

Faculty Disclosure
Cydney E. McQueen reports she has no actual or potential conflicts of interest associated with this presentation.

Learning Objectives

Upon completion of this program pharmacists (or pharmacy technicians) will be able to:

1. Describe common types of risks and benefits of dietary supplements (DS) used for treatment or prevention of cancer or for alleviation of side effects of prescription cancer treatments
2. Name two commonly used DS for prevention and alleviation of side effects of other treatments
3. Describe extent of clinical evidence available for categories of DS
4. Name one DS for cancer treatment with clear clinical evidence that it is NOT effective
5. Name two reliable DS information resources

Pre-Assessment Questions

4. More clinical research exists for DS treatments for cancer than for adjunctive use with other therapies.

True False

Why Do Patients Take DS?

- Safe=Natural
- Optimal Health
- Autonomy
- Access
- Cost
- Hope
- Quick Fix
- Frustration/Mistrust

Which Do You Think?

- Safe=Natural
- Autonomy
- Hope
- Frustration/Mistrust
What Can Happen?

- Works
- Works; interferes w/ other therapy
- Works; has ADEs
- Doesn’t work
- Doesn’t work; interferes w/other therapy
- Doesn’t work; has ADEs
- No effect; waste of money

Highest Risks

- Doesn’t work; interferes with other therapies
- Doesn’t work; has ADEs
  - Dependent upon severity
- Rejection of all follow-up care
- Use of combination products
- Use of multiple combination products

Partial List of Ingredients in Propax™

- Vanadium (as vanadyl sulfate)
- Alpha-Keto Glutarate
- Glutathione (as reduced)
- L-Tyrosine
- N-Acetyl-L-Cysteine
- Taurine
- Green Tea Extract
- Horsetail (as silica)
- Phosphoglycolipids
- EPA (as eicosapentaenoic acid)
- DHA (as docosahexanoic acid)
- Inositol (inositol/inositol nicotinate)
- Grape Seed Extract (proanthocyanidins)
- Magnesium
- Zinc (as methioninate)
- Selenium (as selenomethioninate)
- Copper (as tyrosinate)
- Manganese (as glycinate)
- Chromium (as nicotinate)
- Molybdenum (as glycinate)
- Potassium (as citrate)
- Bioflavonoids
- Boron (as calcium borogluconate)
- Co Enzyme Q10 (ubiquinone)
- Creatine
- Lactoferrin

Risks of Combination Products

- Often not tested at all; formulations developed on very basic theory
- Inappropriate doses
- Lack of identification of dosing

Benefits of Combination Products

- Ingredients have synergistic activity
- Alleviation of side effects of other ingredients?
- Need expert in therapy
  - Traditional Oriental Medicine
  - Ayurvedic medicine

Treatment

- Lots of in vitro or cell line or markers of activity studies
  - Often very promising
    - Turmeric
    - Cat’s claw (*Uncaria tomentosa*)
    - Boswellia
    - MAP30 (*Momordica charantia*, bitter melon)
    - BZL101 (*Scutellaria barbata*, skullcap)
    - American pawpaw (*Asimini triloba*)
    - MGN-3/Biobran (modified arabinoxylan)
    - Wolfberry/goji berry (*Lycium barbarum*)
Treatment

- Little clinical data
  - Especially clinical data of good quality
    - Example: bovine cartilage, coQ10, wheat grass
    - Ukrain (Chelidonium majus)
  - In vitro promise, clinical disappointment...
    - Shark cartilage and Neovastat
    - Still up in the air?
    - Hydrazine
    - Trash it.
  - Laetrile?

Adjunctive Treatment

- Polysaccharide-K (PSK) –
  - Mushroom product (Coriolus versicolor)
  - Approved in Japan
- Polysaccharide peptide (PSP)
  - Mushroom product
  - Used in China
- Ayurvedic
  - Turmeric and ashwaganda

Adjunctive Treatment

- Clinical trials often higher quality
  - Tamoxifen and melatonin
  - Radiation and coenzyme Q10
  - Dacarbazine/interferon-α + melatonin/IL2
  - Melatonin and aloe
  - Irinotecan and melatonin

Adjunctive Treatment

- Varying results
  - Melatonin + carboplatin and etoposide
- Cross-over
  - Mistletoe/Iscador

Alleviation of Side Effects

- Largest category of use
  - Known and unknown
  - QOL

- Largest area of high-quality research
  - Cardiotoxicity
  - Protection of hearing
  - Radiation therapy

Immune Modulation

- Common approach
  - Problem: chemotherapy can adversely affect immune system
  - Goal: illness prevention through immune system support
    - Astragalus
    - Echinacea
    - Mistletoe/Iscador
    - Ashwagandha
    - Melatonin
    - Vitamin C
Antioxidants

- Why?
  - Vitamin C history....
- Area of great controversy
  - If some chemotherapy treatments work by free radical mechanism, won’t antioxidants interfere with treatment?
  - Answer: yes and no....
- Vitamins A, C, and E
- Herbal blends and non-botanicals

Prevention

- Vitamins
  - A, D, E, K, C
  - Beta-carotene
  - Vitamins O, B17
- Minerals
  - Magnesium
- Immune-enhancing herbs and other
  - Echinacea
  - Colostrum
- Amino acids
  - L-carnitine

Reliable Information Resources

- Recent clinical studies
  - Medline, EMBASE, IBIDS
  - Cochrane reviews
- Local Drug Information Center
  - Time and access to databases
- Evidence-based tertiary resources
  - Print
  - Electronic

Finding Clinical Trials

- Medline
  - PubMed
    - "pubmed.gov"
  - IBIDS
    - http://ods.od.nih.gov ➔ Health Information
- EMBASE
  - Pros and cons
- AMED
  - Subscription only

Evidence-Based Tertiary Resources

- Print
  - Quick, easy access
  - Out of date before published....
Evidence-Based Tertiary Resources

- **Electronic Databases**
  - Natural Standard
    - [www.naturalstandard.com](http://www.naturalstandard.com)
  - Natural Medicines Comprehensive Database
    - [www.naturaldatabase.com](http://www.naturaldatabase.com)

Evidence-Based Tertiary Resources

- **Free Websites**
  - Memorial Sloane-Kettering Cancer Center
    - [www.mskcc.org](http://www.mskcc.org) ➔ Cancer Information ➔ Integrative Therapies
  - National Cancer Institute CAM summaries
    - [www.cancer.gov/cancertopics/treatment/cam](http://www.cancer.gov/cancertopics/treatment/cam)

Additional Resource

- **Society for Integrative Oncology**
  - [www.integrativeonc.org](http://www.integrativeonc.org)

Post-Assessment Questions

1. Of the types of risk/benefit combinations for DS, which has the greatest potential for patient harm?
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   C. Works; has ADEs
   D. Works, interferes with other therapies
   E. None of the above
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2. Which of the following pairs are both more commonly used for alleviation of side effects of chemotherapy than for treatment?
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   - B. Vitamin C; coenzyme Q10
   - C. Shark cartilage; vitamin E
   - D. Coenzyme Q10; turmeric
   - E. Turmeric; vitamin C

3. Which of the following does not have sufficient evidence to be considered proven to be an ineffective cancer treatment?
   - A. Vitamin C
   - B. Hydrazine sulfate
   - C. Neovastat
   - D. Shark cartilage
   - E. All of the above
Post-Assessment Questions

4. More clinical research exists for DS treatments for cancer than for adjunctive use with other therapies.
   
   A. True
   B. False

Post-Assessment Questions

5. Which of the sites below is not considered a reliable resource for DS information?
   
   A. www.naturaldatabase.com
   B. www.naturalstandard.com
   C. www.propax.com
   D. www.mskcc.org
   E. All of the above are reliable

Types of Dietary Supplement
Risks and Benefits

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Continuing Pharmacy Education (CPE)

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Enter the Access Code: (case sensitive)
Pharmacists - ___________
Technicians - ___________
Further Reading

Types of Dietary Supplement Risks and Benefits
January 23, 2010

Articles

For overviews and introductions on the topics:

Interactions of natural health products with biomedical cancer treatments.

Dietary supplements in patients with cancer: risks and key concepts, part 1.

Dietary supplements in patients with cancer: risks and key concepts, part 2.

Alternative Cancer Cures: “Unproven” or “Disproven?”
Vickers A. CA Cancer J Clin 2004; 54:110-118. DOI: 10.3322/canjclin.54.2.110

Botanicals used in complementary and alternative medicine treatment of cancer: clinical science and future perspectives.

The controversial place of vitamin C in cancer treatment.

Dietary supplement use in cancer care: help or harm.

Review of reliable information sources related to integrative oncology.

General Dietary Supplement References

Natural Standard (www.naturalstandard.com) [Ulbricht and Basch]
The most evidenced-based resource available. Full version may only be available to pharmacies and other institutions. Print versions are also available: Natural Standard Herb & Supplement Reference: Evidence-Based Clinical Reviews and the Natural Standard Herb & Supplement Handbook: The Clinical Bottom Line
General Dietary Supplement References (continued)

Natural Medicines Comprehensive Database (www.naturaldatabase.com) [Jellin, et al]
Produced by the editors of the *Pharmacist’s Letter*. Very elliptical style of quick summaries, but with links to read original articles.

*Pharmaceutical Care with Dietary Supplements: Concepts and Common Sense* [McQueen]
Concepts and approaches to therapeutic use; no product information

Cancer Resources

Memorial Sloane-Kettering Cancer Center
www.mskcc.org ➔ Cancer Information ➔ Integrative Therapies

National Cancer Institute CAM summaries
www.cancer.gov/cancertopics/treatment/cam

References


2. Eschiti VS. Lesson from comparison of CAM use by women with female-specific cancers to others: it’s time to focus on interaction risks with CAM therapies. *Integrative Canc Therapies* 2007; 6(4):313-344.


32. Simone CB II, Simone NL, Simone V, Simone CB. Antioxidants and other nutrients do not interfere with chemotherapy or radiation therapy and can increase kill and increase survival, part 2. *Altern Therap* 2007; 13(2):40-46.