



# Walking Through the Research Process Using Library Resources

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# Objectives

- Describe the research process
- Describe the PICO question format
- Outline strategies for searching PubMed and CINAHL to find research articles
- Organize research using a citation manager
- Describe how to evaluate a research article and the levels of evidence

# What is Nursing Research?

- A systematic process of inquiry that uses rigorous guidelines to produce unbiased, trustworthy answers to questions about nursing practice.

Houser, J. (2008). *Nursing research: Reading, using, and creating evidence*.  
Sudbury, Mass: Jones and Bartlett Publishers.

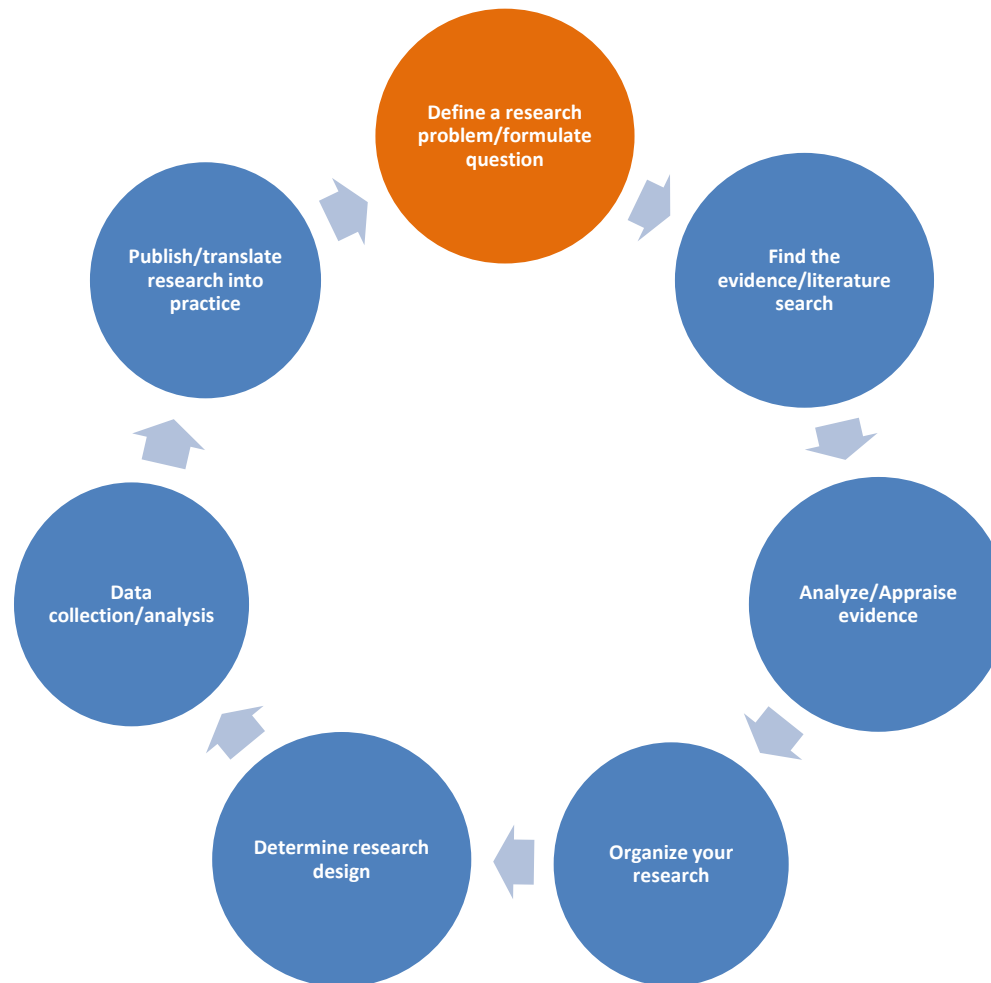
# Research May Be Used To:

- Change nursing care processes
- Influence organizational policies and procedures
- Create or enhance patient care management tools
- Formulate more effective care decisions regarding individual patient needs

# Research Process



# Research Process



# Sources of Research Questions

- Clinical practice
- Educational experience
- Patient feedback
- Professional literature
- Performance improvement/QI

# Define Your Question

- **#1: What type of question is it?**
  - Diagnosis
  - Prognosis
  - Therapy
  - Prevention
  - Education



# Refine Your Question

- **#2: Create an answerable question using the PICO framework**

**P** Patient or Problem

**I** Intervention, prognostic factor, exposure

**C** Comparison

**O** Outcomes

# PICO Example

- **Initial question:** Is there an association between chocolate intake and heart failure in women?
- **Reformulated question:** In middle-aged and elderly Swedish women, is chocolate intake associated with the risk of incident heart failure hospitalization or mortality?

# PICO

**PATIENT/PROBLEM** – middle-aged and elderly  
Swedish women

**INTERVENTION** – chocolate intake

**COMPARISON, IF ANY** – no chocolate intake

**OUTCOME** – incident HF hospitalization or mortality

# Circulation: Heart Failure



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## Original Articles ⇒

### Chocolate Intake and Incidence of Heart Failure

A Population-Based Prospective Study of Middle-Aged and Elderly Women

Elizabeth Mostofsky, MPH, Emily B. Levitan, ScD, Alicja Wolk, DrMedSci and Murray A. Mittleman, MD, DrPH

[+](#) Author Affiliations

Correspondence to Murray A. Mittleman, MD, DrPH, Cardiovascular Epidemiology Research Unit, Department of Medicine, Beth Israel Deaconess Medical Center, 375 Longwood Ave. Room 423. Boston. MA 02115. E-mail

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### This Article

**Circulation: Heart Failure.**  
2010;3:612-616

Published online before print August 16, 2010.  
doi: 10.1161/  
CIRCHEARTFAILURE.110.944025

- [» Abstract Free](#)
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# Understand Your Question

- **#3: Is this a background or foreground question?**
- **Background:** General knowledge
  - Ex: What causes hypertension?
  - Ex: What therapies are commonly used to treat hypertension?
- **Foreground:** Specific knowledge that could directly inform clinical decisions
  - Ex: Can a regular intake of chocolate high in flavanol content lower blood pressure?

# Research Process



# Resources for Background Questions

- **Reliable textbook**
  - HealthLinks eBooks page: 1400+  
*[healthlinks.washington.edu/textbooks](http://healthlinks.washington.edu/textbooks)*
  - HEAL-WA eBooks: 70+  
*[heal-wa.org/ebooks](http://heal-wa.org/ebooks)*
- **UptoDate**
  - Online text with concise, comprehensive up-to-date reviews of clinical topics in multiple specialties

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Updates on diseases and estimates on the burden of disease associated with smoking.
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JAMA now available full text  
Jul 09, 2010

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## search

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Title



Go

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**Nursing Reference Center**

Nursing Reference Center includes information about conditions and diseases, patient education resources, drug information, continuing education, lab & diagnosis detail, best practice guidelines, and more.

**CINAHL (Nursing Literature)**

CINAHL with full text covers nursing, biomedicine, health sciences librarianship, alternative/complementary medicine, consumer health and 17 allied health disciplines and provides the full text for more than 600 journals.

**Nursing Calculators**

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## access



Logged in

### Getting Started

Certain resources in HEAL-WA (indicated by a lock ) require a HEAL-WA access code (UW NetID) and password for access.

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PLEASE NOTE that once you have set up your access code, it can take up to a day for your access code to be recognized so you can log in to HEAL-WA.

## ▼ Search Results for "heart failure"

## ▼ Topic Outline

[All search results](#) | [Prioritize adult topics](#) | [Prioritize pediatric topics](#) | [Prioritize patient topics](#)

- Overview of the therapy of heart failure due to systolic dysfunction
- Treatment of acute decompensated heart failure: General considerations
- Evaluation of the patient with suspected heart failure
- Treatment and prognosis of diastolic heart failure
- Treatment of acute decompensated heart failure: Components of therapy
- Evaluation of the patient with heart failure or cardiomyopathy
- Epidemiology and causes of heart failure
- Pathophysiology of acute decompensated heart failure
- Heart failure self management
- Prognosis of heart failure
- Treatment of acute decompensated heart failure in acute coronary syndromes
- Cardiorenal syndrome: Definition; prognosis; and pathophysiology
- Ventricular arrhythmias in heart failure and cardiomyopathy
- Rationale for and clinical trials of beta blockers in heart failure due to systolic dysfunction
- Evaluation and management of asymptomatic left ventricular systolic dysfunction
- Predictors of survival in heart failure due to systolic dysfunction
- Secondary and primary prevention of sudden cardiac death in heart failure and cardiomyopathy
- Use of beta blockers in heart failure due to systolic dysfunction
- Genetics of dilated cardiomyopathy
- Treatment of hypertension in patients with heart failure
- Clinical manifestations and diagnosis of diastolic heart failure

### Medline ® Abstracts for References 1-3 of 'Overview of the therapy of heart failure due to systolic dysfunction'

**1** [Access the full text of this article](#)

TI 2009 focused update incorporated into the ACC/AHA 2005 Guidelines for the Diagnosis and Management of Heart Failure in Adults: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines: developed in collaboration with the International Society for Heart and Lung Transplantation.

AU Hunt SA, Abraham WT, Chin MH, Feldman AM, Francis GS, Ganiats TG, Jessup M, Konstam MA, Mancini DM, Michl K, Oates JA, Rahko PS, Silver MA, Stevenson LW, Yancy CW

SO Circulation. 2009;119(14):e391-479.

AD

PMID 19324966

**2** [Access the full text of this article](#)

TI Heart failure.

AU Jessup M, Brozena S

SO N Engl J Med. 2003;348(20):2007-18.

AD

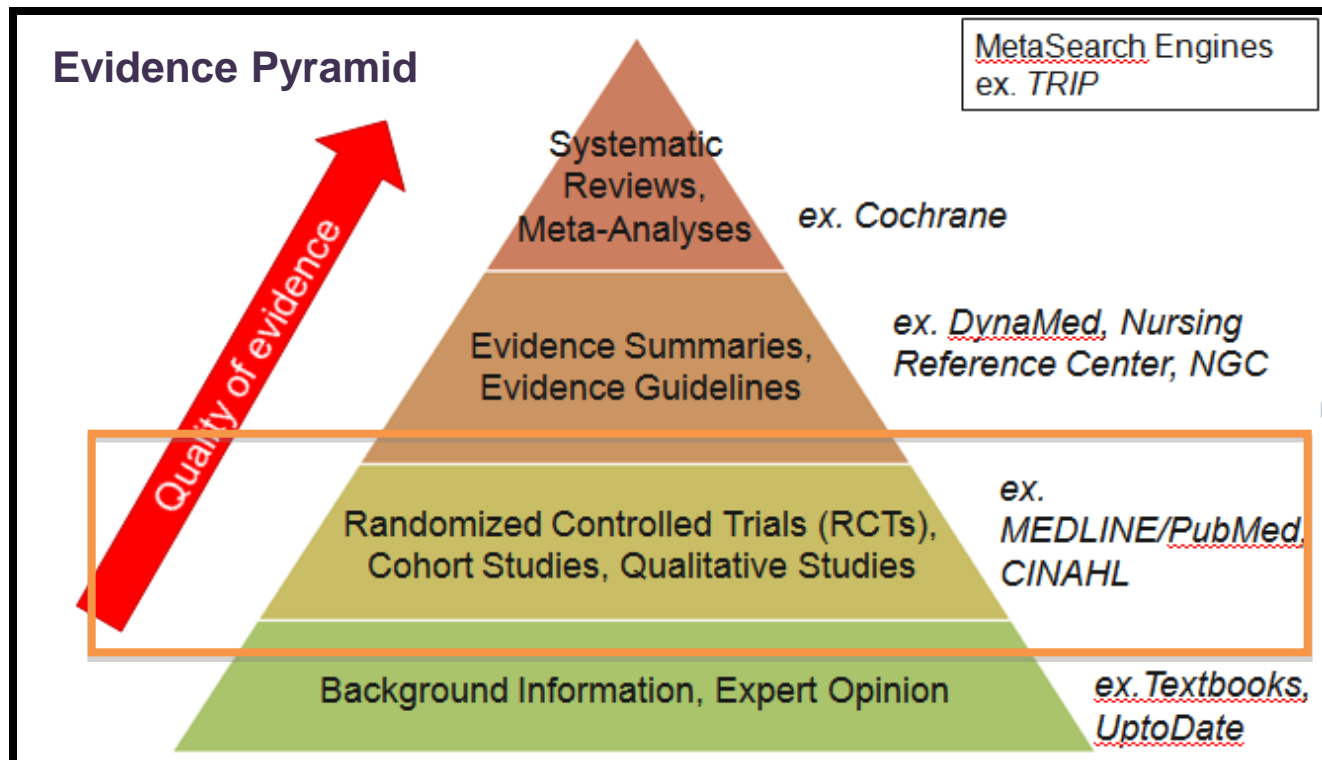
PMID 12748317

**3** [Access the full text of this article](#)

TI ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2008: the Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2008 of the European Society of Cardiology. Developed in collaboration with the Heart Failure Association of the ESC (HFA) and endorsed by the European Society of Intensive Care Medicine (ESICM).

# Resources for Foreground Questions

- Search for evidence-based resources
- Search for primary research articles



# CINAHL vs. PubMed

## CINAHL

- Coverage: 1982+
- Indexes 1700 journals
- Focuses on nursing and allied health literature
- CINAHL Thesaurus with more nursing terms
- Has peer-reviewed limit
- Includes cited references at end of many refs

## PubMed

- Coverage: late 1940' s+
- Indexes 5000 journals
- Focuses on biomedical literature
- Uses MeSH as its controlled vocabulary
- No peer-reviewed limit
- No cited references

# CINAHL or [CINAHL Plus]

- Cumulative Index to Nursing and Allied Health Literature
- Provides coverage from 1982 [1937] to date, of nursing and 17 allied health disciplines literature
- 1700+ [3800+] journals indexed including virtually all English-language nursing journals
- Search with text words and thesaurus terms
- Can easily search for Research articles



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chocolate in **Select a Field (optional)**

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**AND** heart failure in **Select a Field (optional)**

**AND**  in **Select a Field (optional)**

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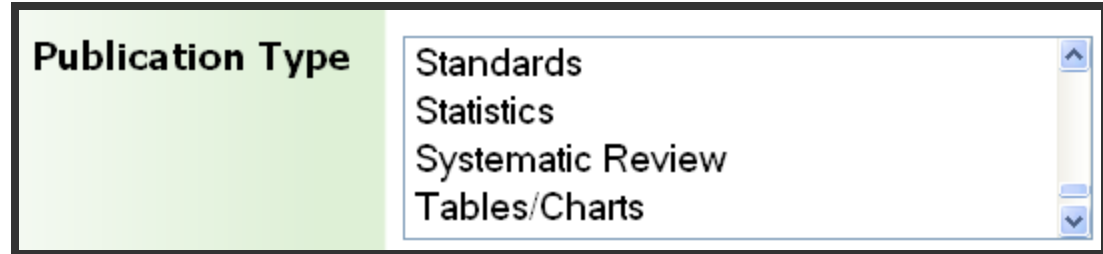
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# CINAHL Publication Type Limits

- Clinical trial
- Critical path
- Practice guidelines
- Research
- Standards
- Systematic review




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2 Results for...

 1. [Chocolate reduces heart failure hospitalization.](#)

American Nurse Today, 2010 Aug; 5 (8). (1p) (journal article) ISSN: 1930-5583 CINAHL AN: 2010852097

Database: CINAHL Plus with Full Text

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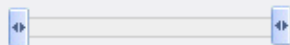
(includes abstract); Janszky I; Mukamal KJ; Ljung R; Ahnve S; Ahlbom A; Hallqvist J; Journal of Internal Medicine, 2009 Sep; 266 (3): 248-57 (journal article - research) ISSN: 0954-6820 PMID: 19711504 CINAHL AN: 2010382209

 Abstract: OBJECTIVES: To assess the long-term effects of **chocolate** consumption amongst patients with established coronary **heart** disease. DESIGN: In a population-based inception cohort study, we followed 1169 non-diabetic patients hospitalized with a confirmed first acute myocardial infarction (AMI) between 1992 and 1994 in Stockholm County, Sweden, as part of the Stockholm **Heart** Epidemiology Program. Participants self-reported usual

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(includes abstract); Janszky I; Mukamal KJ; Ljung R; Ahnve S; Ahlbom A; Hallqvist J; Journal of Internal Medicine, 2009 Sep; 266 (3): 248-57 (journal article - research) ISSN: 0954-6820 PMID: 19711504 CINAHL AN: 2010382209

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sweets was not associated with cardiac or total mortality. CONCLUSIONS: **Chocolate** consumption was associated with lower cardiac mortality in a dose dependent manner in patients free of diabetes surviving their first AMI. Although our findings support increasing evidence that **chocolate** is a rich source of beneficial bioactive compounds, confirmation of this strong inverse relationship from other observational studies or large-scale, long-term, controlled randomized trials is needed.

Subjects: Cacao; Diet; Myocardial Infarction; Myocardial Infarction; Aged: 65+ years; Middle Aged: 45-64 years; Female; Male

Database: CINAHL Plus with Full Text

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# PubMed

- MEDLINE (1940' s+) is included on PubMed
- Indexes 5,000 biomedical journals
- Covers all aspects of biosciences and healthcare
- 75%-80% of citations have abstracts
- Updated 5x/week
- Search with text words or MeSH (thesaurus) terms

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1.

Mostofsky E, Levitan EB, Wolk A, Mittleman MA.  
Circ Heart Fail. 2010 Sep 1;3(5):612-6. Epub 2010 Aug 16.  
PMID: 20713904 [PubMed - indexed for MEDLINE]  
[Related citations](#) [New insights on fetal ductal constriction: role of maternal ingestion of polyphenol-rich foods.](#)

2. Zielinsky P, Piccoli AL Jr, Manica JL, Nicoloso LH.

Expert Rev Cardiovasc Ther. 2010 Feb;8(2):291-8. Review.  
PMID: 20136615 [PubMed - indexed for MEDLINE]  
[Related citations](#) [Chocolate consumption and mortality following a first acute myocardial infarction: the Stockholm Heart Epidemiology Program.](#)

3. Janszky I, Mukamal KJ, Ljung R, Ahnve S, Ahlbom A, Hallqvist J.

J Intern Med. 2009 Sep;266(3):248-57.  
PMID: 19711504 [PubMed - indexed for MEDLINE]  
[Related citations](#) [The anti-inflammatory properties of cocoa flavanols.](#)

4. Selmi C, Mao TK, Keen CL, Schmitz HH, Eric Gershwin M.

J Cardiovasc Pharmacol. 2006;47 Suppl 2:S163-71; discussion S172-6. Review.  
PMID: 16794453 [PubMed - indexed for MEDLINE]  
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## Find related data

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J Intern Med. 2009 Sep;266(3):248-57.

## Chocolate consumption and mortality following a first acute myocardial infarction: the Stockholm Heart Epidemiology Program.

Janszky I, Mukamal KJ, Ljung R, Ahnve S, Ahlbom A, Hallqvist J.

Department of Public Health Sciences, Karolinska Institute, Stockholm, Sweden. imre.janszky@ki.se

### Abstract

**OBJECTIVES:** To assess the long-term effects of chocolate consumption amongst patients with established coronary heart disease.**DESIGN:** In a population-based inception cohort study, we followed 1169 non-diabetic patients hospitalized with a confirmed first acute myocardial infarction (AMI) between 1992 and 1994 in Stockholm County, Sweden, as part of the Stockholm Heart Epidemiology Program. Participants self-reported usual chocolate consumption over the preceding 12 months with a standardized questionnaire distributed during hospitalization and underwent a health examination 3 months after discharge. Participants were followed for hospitalizations and mortality with national registries for 8 years.**RESULTS:** Chocolate consumption had a strong inverse association with cardiac mortality. When compared with those never eating chocolate, the multivariable-adjusted hazard ratios were 0.73 (95% confidence interval, 0.41-1.31), 0.56 (0.32-0.99) and 0.34 (0.17-0.70) for those consuming chocolate less than once per month, up to once per week and twice or more per week respectively. Chocolate consumption generally had an inverse but weak association with total mortality and nonfatal outcomes. In contrast, intake of other sweets was not associated with cardiac or total mortality.**CONCLUSIONS:** Chocolate consumption was associated with lower cardiac mortality in a dose dependent manner in patients free of diabetes surviving their first AMI. Although our findings support increasing evidence that chocolate is a rich source of beneficial bioactive compounds, confirmation of this strong inverse relationship from other observational studies or large-scale, long-term, controlled randomized trials is needed.

PMID: 19711504 [PubMed - indexed for MEDLINE]

[+ Publication Types, MeSH Terms](#)[+ LinkOut - more resources](#)

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[Coffee consumption and mortality after acute myocardial infarction: the Stockholm Heart Epidemiology Program \[Am Heart J. 2009\]](#)[Increased risk and worse prognosis of myocardial infarction in patients with established coronary heart disease \[Brain. 2009\]](#)[Chocolate intake and incidence of heart failure: a population-based prospective study \[Circ Heart Fail. 2010\]](#)[Review Potential survival gains in the treatment of myocardial infarction. \[Heart. 2009\]](#)[Review Meta-analysis of adverse cardiovascular outcomes as a function of cocoa intake \[Am J Cardiol. 2009\]](#)[See reviews...](#)[See all...](#)

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[Polyphenols from cocoa and vascular health: a critical review. \[Int J Mol Sci. 2009\]](#)

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- **Literature searching:** your librarian can work with you to create a focused search
  - Sometimes this takes **several iterations** because you will discover new information and ideas
  - You may need to **revise** your research question
  - You need to **think critically** about the search

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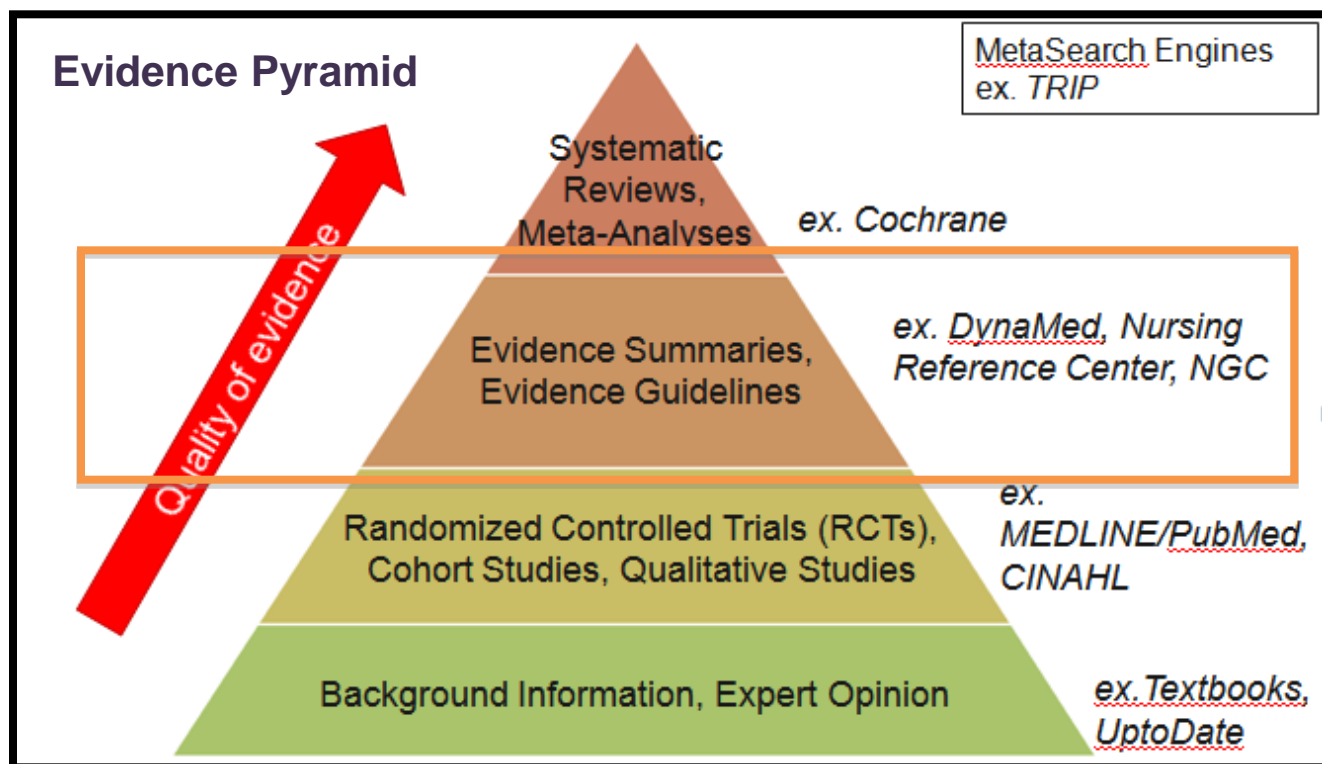
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# Resources for Foreground Questions

- Evidence Summaries



# Search for Evidence Summaries

- **DynaMed**
  - Evidence-based clinical resource providing summaries of 3500+ diseases and conditions
- **Nursing Reference Center**
  - Comprehensive point-of-care resource for nurses that includes Evidence-based Care Sheets
- **Natural Standard**
  - Provides high quality, evidence-based information on herbs, vitamins, diets, complementary practices (modalities), and medical conditions

# DynaMed

- Provides summaries of the best evidence for over 3,500 clinical topics
- Can quickly browse and find key recommendations
- Updated daily
- Links out to full-text articles
- Download available for PDA and iPhones

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## Dietary recommendations for cardiovascular disease prevention

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Evidence for Nutrition Counseling

Modifying Fatty Acid Intake

Omega-3 Fatty Acids

Carbohydrates

DASH Diet

Mediterranean Diet

Fiber

Meat

Nuts

Fruit and Vegetable Intake

Salt

Micronutrient Supplementation

Evidence for Specific Foods and Beverages

References Including Reviews and Guidelines

Patient Information

Acknowledgements

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### Chocolate:

- **flavonoid content of chocolate may reduce risk of cardiovascular mortality ([level 2 \[mid-level\] evidence](#))**
  - based on meta-analysis within review of 136 studies
  - Reference - [Nutrition & Metabolism 2006 Jan 3;3\(1\):2 full-text](#)
- **up to 2 chocolate servings/week associated with decreased risk for heart failure in women ([level 2 \[mid-level\] evidence](#))**
  - based on prospective cohort study in Sweden
  - 31,823 women aged 48-83 years without baseline diabetes, history of heart failure or myocardial infarction completed food questionnaire and were followed for 9 years
  - 1.3% (419 women) hospitalized for or died from heart failure
  - adjusted risk for heart failure compared to no regular chocolate intake (p for trend = 0.0005)
    - rate ratio (RR) 0.74 (95% CI 0.58-0.95) with 1-3 servings of chocolate/month
    - 0.68 (95% CI 0.5-0.93) with 1-2 servings/week
    - 1.09 (95% CI 0.74-1.62) with 3-6 servings/week
    - 1.23 (95% CI 0.73-2.08) with ≥ 1 servings/day
  - Reference - [Circ Heart Fail 2010 Aug 16 early online](#)
  - *DynaMed commentary* -- type of chocolate not recorded
- **≥ 1 serving of chocolate weekly may reduce cardiovascular events in older women ([level 2 \[mid-level\] evidence](#))**
  - based on prospective cohort study
  - 1,216 older women (age range not reported) who were originally recruited for a randomized trial of calcium supplements completed baseline dietary questionnaires and were followed for 9.5 years
  - 1 serving defined as 25-50 g chocolate containing 5%-15% cocoa
  - 52% reported consuming ≥ 1 serving of chocolate per week
  - comparing women consuming ≥ 1 serving of chocolate per week vs. < 1 serving per week
    - atherosclerotic vascular disease events in 20.7% vs. 27.3% (p 0.01)
    - ischemic heart disease events in 10.2% vs. 15.2% (p = 0.01)
    - heart failure in 2.8% vs. 6% (p = 0.01)
  - Reference - [Arch Intern Med 2010 Nov 8;170\(20\):1857](#)
- **higher cocoa intake associated with lower all-cause mortality, cardiovascular mortality, systolic blood pressure and diastolic blood pressure ([level 2 \[mid-level\] evidence](#))**
  - based on 15-year follow-up of 470 elderly men free of chronic diseases at baseline



# Nursing Reference Center

- Evidence-based summaries
  - Diseases & Conditions
  - Evidence-based Care Sheets
  - Quick Lessons
  - Information about drugs and medications
  - Skills & Procedures
  - Patient Education
  - CE

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### Key Content

*Diseases & Conditions includes:*

- Quick Lessons**  
 Clinically-organized nursing overviews that are designed to map the nursing work flow
- Evidence-Based Care Sheets** EB  
 Evidence-based summaries on key topics incorporating the best available evidence through rigorous systematic surveillance

**Title:** *Heart Failure and Nutrition* By: Kellicker PG, Schub T, Pravikoff D, CINAHL Nursing Guide, March 19, 2010

**Database:** *Nursing Reference Center*

## Heart Failure and Nutrition

### Contents

- [Description/Etiology](#)
- [Facts and Figures](#)
- [Risk Factors](#)
- [Signs and Symptoms/Clinical Presentation](#)
- [Assessment](#)
- [Treatment Goals](#)
- [Food for Thought](#)
- [Red Flags](#)
- [What Do I Need to Tell the Patient/Patient's Family?](#)
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### Quick Lesson

By: Patricia G. Kellicker, BSN; Tanja Schub, BS

Edited by: Diane Pravikoff, RN, PhD, FAAN

Cinahl Information Systems

#### Description/Etiology

Heart failure (HF) is a progressive clinical syndrome in which the heart fails to pump a sufficient supply of blood throughout the body due to a functional or structural disorder. HF can be classified as left-sided or right-sided, acute or chronic, and systolic or diastolic. Systolic dysfunction causes the heart to lose its ability to contract and pump sufficient blood per beat, whereas diastolic dysfunction inhibits the heart's ability to relax and fill with an adequate amount of blood prior to each contraction. HF is the endpoint of several types of cardiovascular disease. Although it may be treated with drugs or heart transplantation, HF is often fatal (see [Quick Lesson About...Heart Failure: an Overview](#)).

Cardiac cachexia (CC), a common complication of HF is a complex series of biochemical interactions within the body that result in a loss of lean muscle mass, fat, and bone. CC is diagnosed when weight loss > 7.5% of the previous normal weight is observed over a period of 6 months. HF may lead to cardiac cachexia as a result of

- increased caloric requirements; patients with severe HF have an 18% increased energy expenditure at rest
  - Patients with severe HF have elevated levels of tumor necrosis factor (TNF) and other inflammatory cytokines, which increase the metabolic rate of tissues
  - HF often requires an increased respiratory effort that causes an increase in body temperature, both of which burn more calories
- nausea and decreased appetite, which can occur when the liver and intestines swell due to obstructed blood flow
- inadequate nutrient absorption because of intestinal edema

Sodium restriction is the primary dietary recommendation for treatment of HF to minimize fluid overload. A low-sodium diet (i.e., maximum 2-3 g/day) reduces fluid retention and peripheral and pulmonary edema. It is important, however, to consider the overall dietary composition in patients with HF. Caloric and nutrient deficiencies are common in this patient population as a result of reduced food intake, loss of key nutrients due to diuretic therapy (e.g., potassium, magnesium, thiamine), and altered gastrointestinal absorption of nutrients. Malnutrition in patients with HF may also result from metabolic impairment of cardiac and

### Related Information

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[Clinical Bottom Line/Effectiveness](#)
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[Precautions/Contraindications](#)
[Interactions](#)
[Mechanism of Action](#)
[History](#)
[Evidence Table](#)
[Evidence Discussion](#)
[Products Studied](#)
[Author Information](#)
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## Chocolate

**Natural Standard** Professional Monograph, Copyright © 2011 ([www.naturalstandard.com](http://www.naturalstandard.com)).

### Synonyms/Common Names/Related Substances:

- Anandamide, black chocolate (BC), *Butyrum cacao*, cacahuatl (Nahuatl), cacao (Brazilian Portuguese, English, Spanish), cacao bean husk extract, cacao tree, cacaoboom (Dutch), cacaoeiro (Brazilian Portuguese), cacaoyer (French), cacaueiro (Brazilian Portuguese), caffeine, carboxylic acids, catechin, CBC, CBH, chocolatl (Nahuatl), chocol (Mayan), chocolate flavonoids, chocolate milk, chocolate tree, cocoa bean, cocoa bran, cocoa butter, cocoa husk, cocoa oil, cocoa powder, cocoa tree, CocoaVia®, dark chocolate, Dutch chocolate, epicatechin, FCMC, fiber, flavan-3-ols, flavanols, flavonoids, granos de cacao (Spanish), harilik kakaopuu (Estonian), hot chocolate, inulin, isomalt, kakao (Danish), Kakao (German), kakaó(fa) (Hungarian), Kakaobaum (German), Kakaopflanze (German), kakaotræ (Danish), kakaowiec (Polish), kakav (Slovenian), kawkaw (Mayan), ke ke (Chinese), lipids, methylxanthine alkaloids, methylxanthines, milk chocolate, N-linoleoylethanolamine, N-oleoethanolamine, oleic acid, oligofructose, palmitic acid, phenylethylamine, phytochemicals, phytosterols, polyphenols, procyanidin oligomers, procyanidins, purine alkaloids, saturated fatty acids, sorbitol, stearic acid, *Sterculiaceae* (family), stimulant drug, sucrose, *Theobroma cacao* L., theobromine, white chocolate, xocoatl (Mayan, Nahuatl), xocolatl (Mayan, Nahuatl).
- **NOTE:** This monograph covers *Theobroma cacao*, cacao, cocoa products, and chocolate.

### Clinical Bottom Line/Effectiveness

#### Brief Background:

- Cocoa and chocolate are derived from the cacao bean (*Theobroma cacao*). Cocoa products have been considered delicacies for thousands of years and have recently been recognized as a significant source of a number of bioactive constituents with promising salutary effects, such as the catechin and procyanidin families of antioxidant polyphenolic compounds.
- Traditionally, cocoa formulations have been used as antiseptics, diuretics, ecboics, emmenagogues, and parasiticides, as well as to treat alopecia, burns, cough, dry lips, eye problems, fever, diarrhea, listlessness, malaria, nephrosis, parturition, rheumatism,



## Synonyms

## Clinical Bottom Line/Effectiveness

### [Dosing/Toxicology](#)

### [Precautions/Contraindications](#)

### [Interactions](#)

### [Mechanism of Action](#)

### [History](#)

### [Evidence Table](#)

### [Evidence Discussion](#)

### [Products Studied](#)

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## Clinical Bottom Line/Effectiveness

### Brief Background:

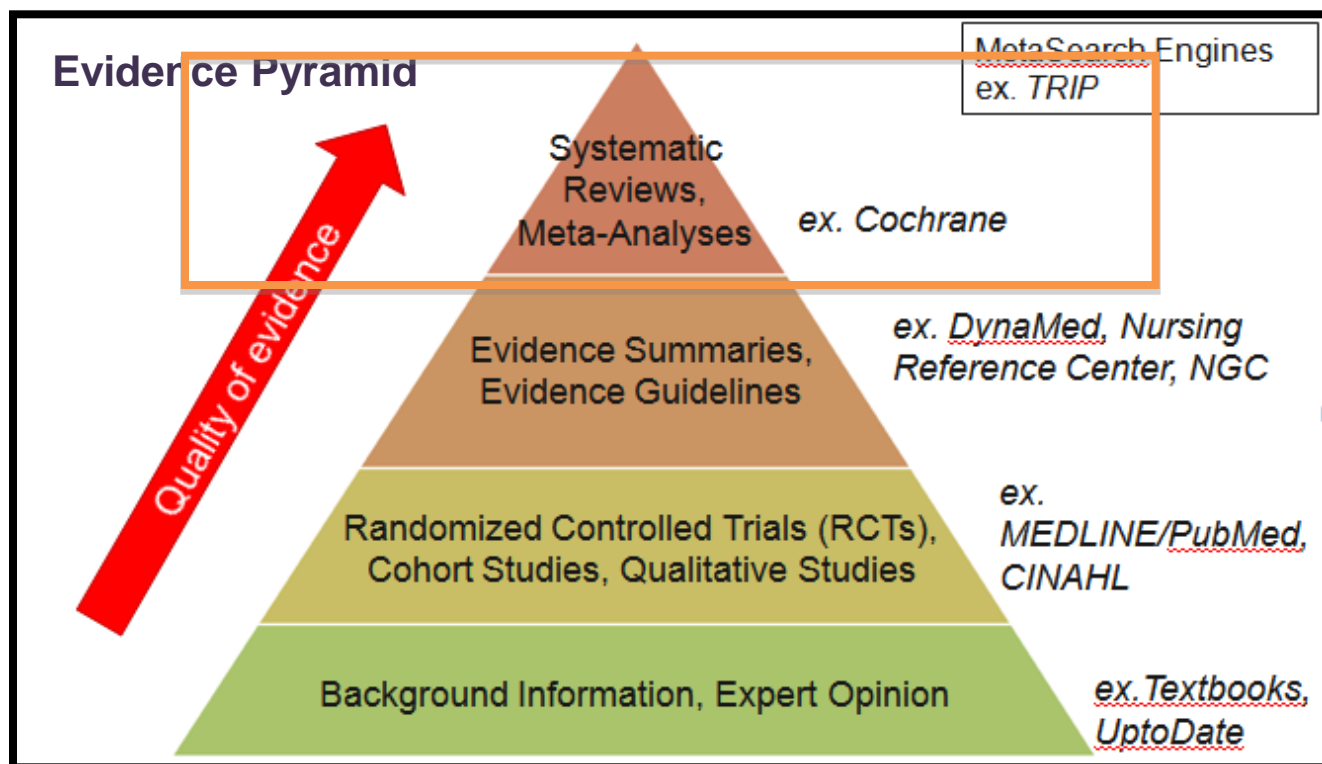
- Cocoa and chocolate are derived from the cacao bean (*Theobroma cacao*). Cocoa products have been considered delicacies for thousands of years and have recently been recognized as a significant source of a number of bioactive constituents with promising salutary effects, such as the catechin and procyanidin families of antioxidant polyphenolic compounds.
- Traditionally, cocoa formulations have been used as antiseptics, diuretics, ecobolics, emmenagogues, and parasiticides, as well as to treat alopecia, burns, cough, dry lips, eye problems, fever, diarrhea, listlessness, malaria, nephrosis, parturition, rheumatism, snakebite, and wounds. Cocoa butter has also been used to treat wrinkles on the skin, to prevent stretch marks (particularly during pregnancy), and as a compounding base for various pharmaceutical preparations, including rectal suppositories.
- Many health benefits associated with cocoa products have been examined clinically. Chocolate flavonoids, found in the highest amounts in dark chocolate, exhibit antioxidative and cardioprotective properties, inhibit platelet activity, and activate endothelial nitric oxide synthase. Cocoa formulations have also been studied for their therapeutic efficacy in the treatment of coronary artery disease, hypercholesterolemia, skin conditions, vascular disorders, and pediatric constipation, as well their ability to heal wounds, repel insects, and lower blood pressure. Chocolate cravings have also been examined in human studies.
- Currently, high-quality human trials supporting the use of chocolate for any indication are lacking. Complicating recommendations of chocolate intake are the varying flavonoid contents of commercial cocoa products. Fermentation, roasting, and alkalizing during manufacturing may lead to losses of beneficial flavonoid compounds. Additional clinical studies using strictly characterized cocoa are necessary to elucidate any relationship between therapeutic efficacy and flavonoid content.

### Quality of Scientific Evidence:

Indication	Evidence Grade
<a href="#">Antioxidant</a>	C
<a href="#">Anti-platelet effects</a>	C
<a href="#">Cardiovascular health</a>	C
<a href="#">Constipation</a>	C

# Resources for Foreground Questions

- Systematic Reviews



# Systematic Reviews vs Meta-Analyses

A ***Systematic review***: is a literature review focused on a single question which tries to identify, appraise, select and synthesize all high quality research evidence relevant to that question.

***Meta-analyses***: are systematic reviews that combine the results of several studies using quantitative statistics.

# Cochrane Database of Systematic Reviews

- Widely regarded as the “gold standard” of evidence-based information
- Extensive systematic reviews and complex synthesis
- Very focused, specific questions
- Includes full-text reviews and protocols
- Cochrane Abstracts indexed in PubMed and CINAHL



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- [Effect of chocolate on blood pressure](#)  
 Karin Ried, Thomas R Sullivan, Peter Fakler, Oliver R Frank, Nigel P Stocks  
 December 2010  
New Protocol
- [Effects of restricted caffeine intake by mother on fetal, neonatal and pregnancy outcome](#) ←  
 Shayesteh Jahanfar, Halimah Sharifah  
 March 2010  
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### [Intervention Review]

## Effects of restricted caffeine intake by mother on fetal, neonatal and pregnancy outcome

Shayesteh Jahanfar<sup>1</sup>, Halimah Sharifah<sup>2</sup>

<sup>1</sup>Department of Public Health, Royal College of Medicine, Perak/University of Kuala Lumpur, Ipoh, Malaysia. <sup>2</sup>Department of Obstetrics and Gynaecology, Royal College of Medicine Perak, Ipoh, Malaysia

Contact address: Shayesteh Jahanfar, Department of Public Health, Royal College of Medicine, Perak/University of Kuala Lumpur, No 3, Greentown Street, Ipoh, Perak, 30450, Malaysia. [jahanfar2000@yahoo.com](mailto:jahanfar2000@yahoo.com). [jahanfar@perakmed.edu.my](mailto:jahanfar@perakmed.edu.my).

### Authors' conclusions

There is insufficient evidence to confirm or refute the effectiveness of caffeine avoidance on birthweight or other pregnancy outcomes. There is a need to conduct high-quality, double-blinded RCTs to determine whether caffeine has any effect on pregnancy outcome.

### Background

Maternal caffeine consumption during pregnancy may have adverse effects on fetal, neonatal and maternal outcomes.

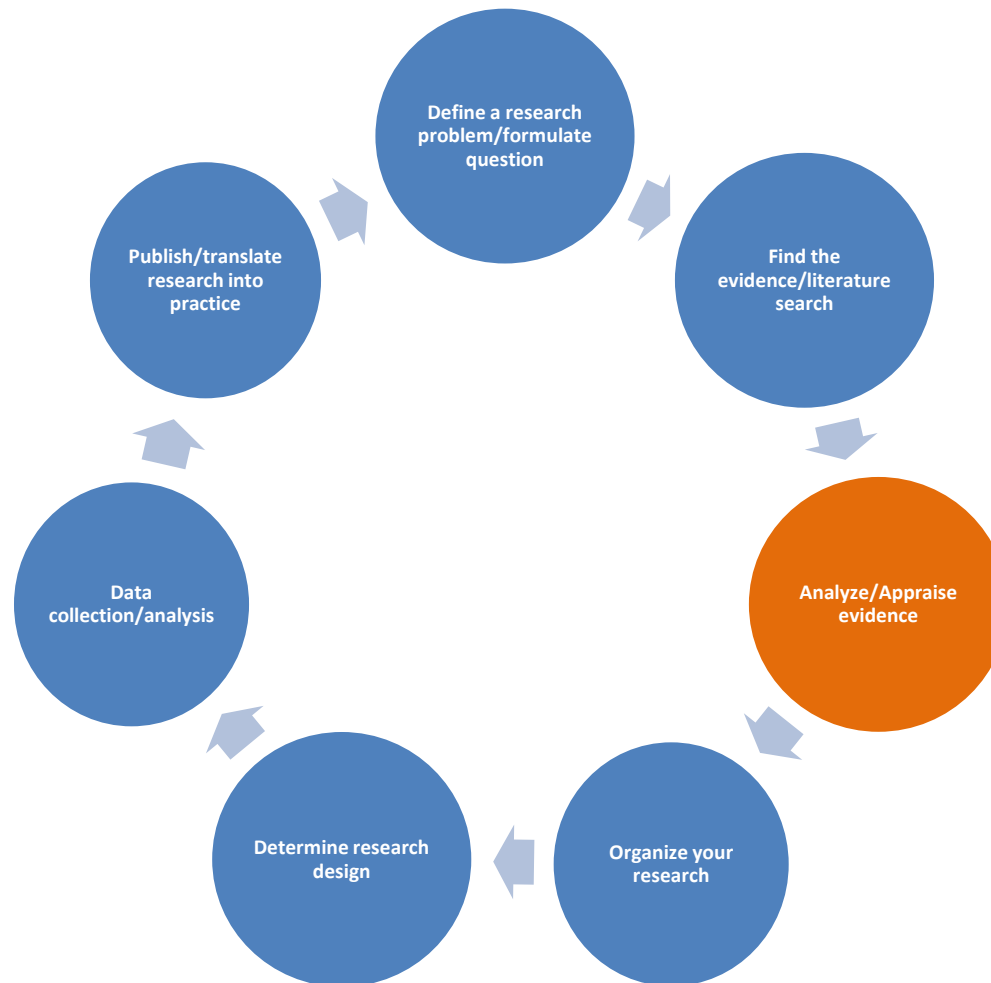
### Objectives

ed in Issue 3, 2010.

cy outcome. *Cochrane Database*

[Next >](#)

# Research Process



# How to Scan a Research Article

- **First, read:**
  - TITLE, ABSTRACT, and INTRO
  - Section and Sub-Section HEADINGS
  - CONCLUSIONS
- **Second, look at:**
  - Discussion
  - References
  - Graphs, tables
- **Third, read entire article if interested in more details**



# Appraising the Evidence Q' s

- Given my clinical question, what is the appropriate study design?
- Is this study (or review) valid?
- Are the results significant (important)?
  - Number Needed to Treat (NNT)
- Are the patients in those studies similar to mine?
- Is the treatment setting similar to mine?

# Steps to Appraising Evidence Resources

- Determine the level of evidence
- Use a critical appraisal guide
- Create a study evaluation table



# Levels and Grades of Evidence

## Levels of Evidence and Grades of Recommendations

Grade of recommendation	Level of evidence	Interventions
A	1a	Systematic review of randomized controlled trials
	1b	Individual randomized controlled trial
B	2a	Systematic review of cohort studies
	2b	Individual cohort study
	3a	Systematic review of case-control studies
	3b	Individual case-control study
C	4	Case series
D	5	Expert opinion without explicit critical appraisal or based on physiology or bench research

# Appraisal Guides

- CEBM (Oxford) Critical Appraisal Sheets
  - <http://www.cebm.net/index.aspx?o=1913>
- CEBM (Toronto) Critical Appraisal Worksheets
  - <http://ktclearinghouse.ca/cebm/practise/ca/worksheets>



# Therapy: Critical Appraisal Sheet

1a. R- Was the assignment of patients to treatments <u>randomised</u> ?	
What is best?	Where do I find the information?
Centralised computer randomisation is ideal and often used in multi-centred trials. Smaller trials may use an independent person (e.g. the hospital pharmacy) to "police" the randomization.	The <b>Methods</b> should tell you how patients were allocated to groups and whether or not randomisation was concealed.
This paper: Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear <input type="checkbox"/>	
Comment:	
1b. R- Were the groups <u>similar</u> at the start of the trial?	
What is best?	Where do I find the information?
If the randomisation process worked (that is, achieved comparable groups) the groups should be similar. The more similar the groups the better it is. There should be some indication of whether differences between groups are statistically significant (i.e. p values).	The <b>Results</b> should have a table of "Baseline Characteristics" comparing the randomized groups on a number of variables that could affect the outcome (i.e. age, risk factors etc). If not, there may be a description of group similarity in the first paragraphs of the <b>Results</b> section.
This paper: Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear <input type="checkbox"/>	
Comment:	
2a. A - Aside from the allocated treatment, were groups treated equally?	
What is best?	Where do I find the information?
Apart from the intervention the patients in the different groups should be treated the same, eg., additional treatments or tests.	Look in the <b>Methods</b> section for the follow-up schedule, and permitted additional treatments, etc and in <b>Results</b> for actual use.
This paper: Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear <input type="checkbox"/>	
Comment:	
2b. A - Were all patients who entered the trial accounted for? - and were they analysed in the groups to which they were randomised?	
What is best?	Where do I find the information?
Losses to follow-up should be minimal – preferably less than 20%. However, if few patients have the outcome of interest, then even small losses to follow-up can bias the results. Patients should also be analysed in the groups to which they were randomised – 'intention-to-treat analysis'.	The <b>Results</b> section should say how many patients were randomised (eg., Baseline Characteristics table) and how many patients were actually included in the analysis. You will need to read the results section to clarify the number and reason for losses to follow-up.
This paper: Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear <input type="checkbox"/>	
Comment:	
3. M - Were measures <u>objective</u> or were the patients and clinicians kept " <u>blind</u> " to which treatment was being received?	
What is best?	Where do I find the information?
It is ideal if the study is 'double-blinded' – that is, both patients and investigators are unaware of treatment allocation. If the outcome is objective (eg., death) then blinding is less critical. If the outcome is subjective (eg., symptoms or function) then blinding of the outcome assessor is critical.	First, look in the <b>Methods</b> section to see if there is some mention of masking of treatments, eg., placebos with the same appearance or sham therapy. Second, the <b>Methods</b> section should describe how the outcome was assessed and whether the assessor's were aware of the patients' treatment.

# Create a study evaluation table

## Evaluation Table Template

A. The column headings for the evaluation table. Copy and paste this header into a text document.

Author (Year)	Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables Studied (and Their Definitions)	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice

B. A description of each column's content. Put the data extracted from the studies in the correct column.

(Put citation here.)	(Theoretical basis for study goes here.)	(Describe design and how study was carried out.)	(This column contains number and characteristics of patients; attrition rate and why.)	(List and define independent and dependent variables.)	(Here go scales used to measure outcome variables, including name and author of scale and data on validity and reliability.)	(Put statistics used to answer clinical question here; but don't need to include all.)	(These are statistical or qualitative findings—there should be a finding for every statistical test in previous column.)	(Describe strengths and limitations of study; risk or harm if study intervention or findings are implemented; feasibility of use in your practice.  Remember: level of evidence + quality of evidence = strength of evidence and confidence to act.)
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Fineout-Overholt E, Melnyk BM, Stillwell SB, Williamson KM. Critical Appraisal of the Evidence: Part I. *Am J Nurs*. 2010 Jul;110(7):47-52.

# Research Process



# Use a Citation Manager

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Title: Chocolate consumption and mortality following a first acute myocardial infarction: the Stockholm Heart Epidemiology Program

 Authors: [Janszky,I.](#); [Mukamal,K.J.](#); [Ljung,R.](#); [Ahnve,S.](#); [Ahlbom,A.](#); [Hallqvist,J.](#)

 Source: [J.Intern.Med.](#), 2009, 266, 3, 248-257, England

 Ref ID: 1282

Journal Article (Electronic) Reference 2 of 4

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Title: Chocolate intake and incidence of heart failure: a population-based prospective study of middle-aged and elderly women

 Authors: [Mostofsky,E.](#); [Levitan,E.B.](#); [Wolk,A.](#); [Mittleman,M.A.](#)

 Source: [Circ.Heart Fail.](#), 2010, 3, 5, 612-616, United States

 Ref ID: 1285

Journal Article (Electronic) Reference 3 of 4

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Title: The anti-inflammatory properties of cocoa flavanols

 Authors: [Selmi,C.](#); [Mao,T.K.](#); [Keen,C.L.](#); [Schmitz,H.H.](#); [Eric Gershwin,M.](#)

 Source: [J.Cardiovasc.Pharmacol.](#), 2006, 47 Suppl 2, S163-71; discussion S172-6, United States

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Title: New insights on fetal ductal constriction: role of maternal ingestion of polyphenol-rich foods

 Authors: [Zielinsky,P.](#); [Piccoli,A.L., Jr.](#); [Manica,J.L.](#); [Nicoloso,L.H.](#)

 Source: [Expert Rev.Cardiovasc.Ther.](#), 2010, 8, 2, 291-298, England

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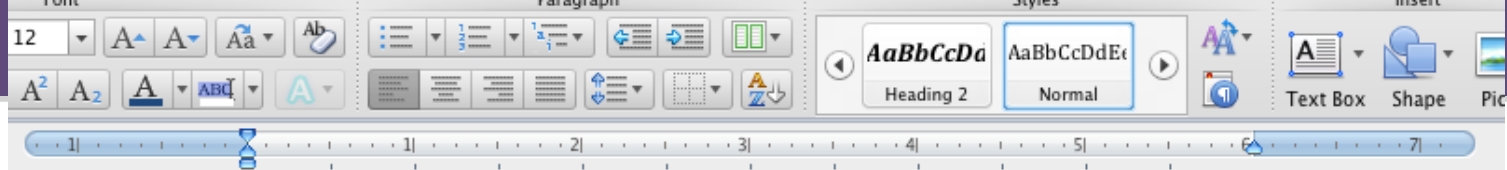




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## References

- Janszky, I., Mukamal, K. J., Ljung, R., Ahnve, S., Ahlbom, A., & Hallqvist, J. (2009). Chocolate consumption and mortality following a first acute myocardial infarction: The stockholm heart epidemiology program. *Journal of Internal Medicine*, 266(3), 248-257.
- Mostofsky, E., Levitan, E. B., Wolk, A., & Mittleman, M. A. (2010). Chocolate intake and incidence of heart failure: A population-based prospective study of middle-aged and elderly women. *Circulation.Heart Failure*, 3(5), 612-616. doi:10.1161/CIRCHEARTFAILURE.110.944025
- Selmi, C., Mao, T. K., Keen, C. L., Schmitz, H. H., & Eric Gershwin, M. (2006). The anti-inflammatory properties of cocoa flavanols. *Journal of Cardiovascular Pharmacology*, 47 Suppl 2, S163-71; discussion S172-6.
- Zielinsky, P., Piccoli, A. L., Jr, Manica, J. L., & Nicoloso, L. H. (2010). New insights on fetal ductal constriction: Role of maternal ingestion of polyphenol-rich foods. *Expert Review of Cardiovascular Therapy*, 8(2), 291-298. doi:10.1586/erc.09.174



This is a test document. (Janszky et al., 2009)

### References

Janszky, I. Mukamal, K. I. Ljung, R. Ahnve, S. Ahlbom, A. & Hallqvist, J. (2009).

Chocolate consumption and mortality following a first acute myocardial

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<a href="#">Cite View</a> <a href="#">Janszky, I.</a>	2009	Chocolate consumption and mortality following a first acute myocardial infarction: the Stockholm Heart Epidemiology Program
<a href="#">Cite View</a> <a href="#">Mostofsky, E.</a>	2010	Chocolate intake and incidence of heart failure: a population-based prospective study of middle-aged and elderly women
<a href="#">Cite View</a> <a href="#">Selmi, C.</a>	2006	The anti-inflammatory properties of cocoa flavanols
<a href="#">Cite View</a> <a href="#">Zielinsky, P.</a>	2010	New insights on fetal ductal constriction: role of maternal ingestion of polyphenol-rich foods

Sort by Authors, Primary

# Research Process

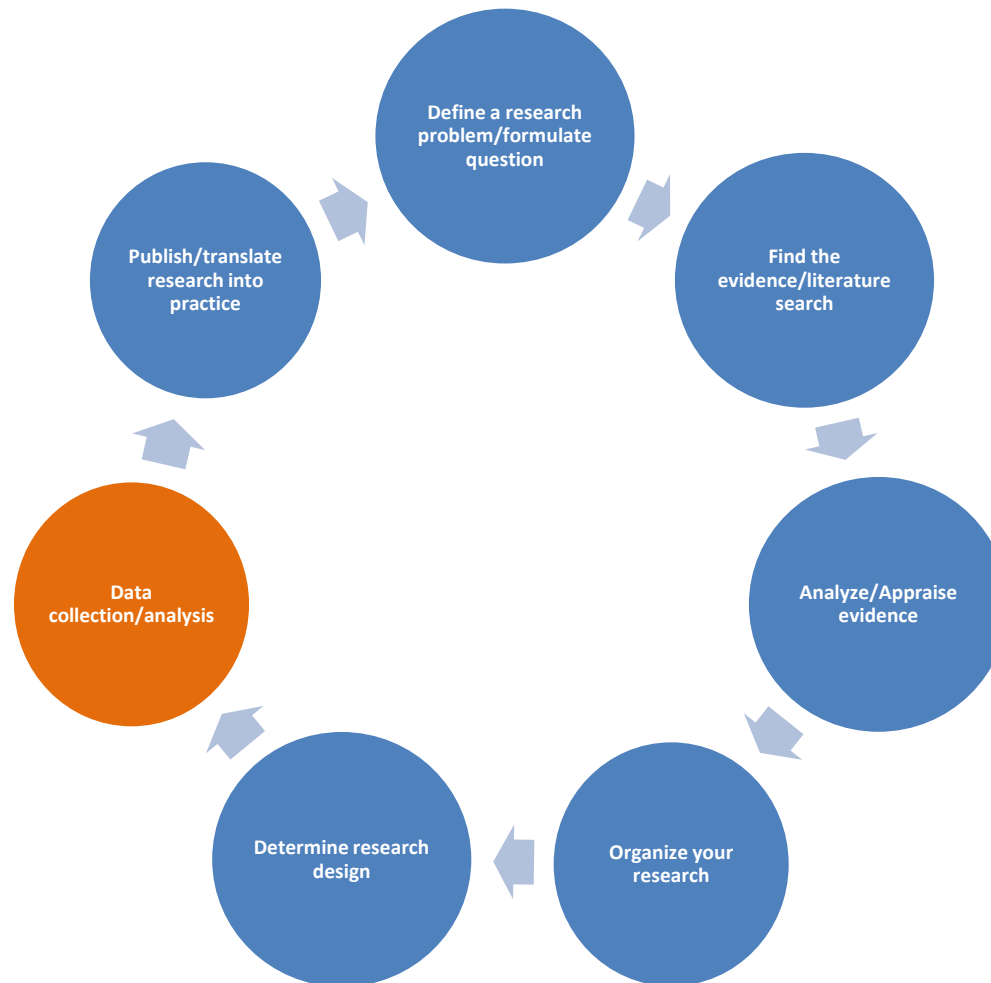




# Determine Research Design

- **Select a design appropriate for nature of the question**
  - Quantitative research
  - Qualitative research
  - Mixed methods: both quantitative and qualitative
- **And the time dimension**
  - Retrospective study: uses secondary data already collected
  - Prospective: conducted by researcher; real-time process to collect primary data for this study
  - Longitudinal: conducted over time

# Research Process



# Data Collection/Analysis

- Design a **sampling** plan detailing how subjects are recruited and assigned to groups, and how many needed
- **Collect** data with appropriate data collection protocols and reliable/valid methods: physiologic and psychometric; questionnaires; interviews; focus groups, observation, etc.
- **Analyze and report** data with techniques appropriate for type of data collected and that will answer the question:  
e.g., statistical tests, standard error, bar chart, scatter plots, mean, median, etc.

# Research Process



# Dissemination of Research

- Communicate your findings
- Conference presentations
- Posters
- Practice guidelines
- Publish! Publish! Publish!



# Translate Research into Practice

- **Apply** the findings to your clinical practice along with your clinical expertise and patient's values and preferences
- **Evaluate** the outcomes of your practice decisions or changes based on evidence
- Melnyk BM, Fineout-Overholt E, et al. Evidence-based practice: step-by-step. 8 article series in *American Journal of Nursing* which overviews EBP for nursing.
  - <http://journals.lww.com/ajnonline/pages/collectiondetails.aspx?TopicalCollectionId=10>

# Additional Resources

- Tutorials
  - <http://healthlinks.washington.edu/howto/cinahlplus/index.pdf>
  - <http://healthlinks.washington.edu/howto/pubmed/>
  - <http://healthlinks.washington.edu/howto/connect/>
- Resource for Non-UW
  - <http://heal-wa.org/>

# For more information...

- **Affiliated with UW**, contact the *nursing library liaison*:  
Janet G Schnall, MS,AHIP  
206.543.7474  
schnall@u.washington.edu
- **At HMC**, contact the *HMC librarian*:  
Amy Harper, MLIS  
206.744.7744  
alharper@u.washington.edu
- Or, contact your institution's librarian





# Walking Through the Research Process Using Library Resources

PowerPoint presentation located:

*[healthlinks.washington.edu/hsl/liaisons/harper/hmc2011.ppt](http://healthlinks.washington.edu/hsl/liaisons/harper/hmc2011.ppt)*