



E-Resources for Ambulatory Care

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Objectives

- Identify current E-Resources for ambulatory care
- Discuss clinical application of E-Resources for evidence-based nursing practice to improve patient care
- Describe several mobile apps to use in ambulatory care

List of E-Resources for Ambulatory Care

E-Resources for Ambulatory Care Nursing

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<http://libguides.hsl.washington.edu/schnall>

This list includes selected E-Resources for ambulatory care nursing.

Key

\$=Fee required (or contact your local library)

M=Mobile (includes mobile applications and interfaces optimized for mobile access)

O=Online

H=HEAL-WA (Online access to evidence-based health information resources for Washington State nurses and other health professionals; registration required) <http://heal-wa.org/>

*****=E-Resource discussed in the presentation

General Medical Information

ACCESSSS <http://plus.mcmaster.ca/accesssss/>

Meta-search engine that simultaneously searches evidence-driven medical publications and high quality clinical literature. Need to register. **O***

CINAHL Cumulative Index to Nursing and Allied Health Literature

<http://www.ebscohost.com/biomedical-libraries/the-cinahl-database>

Indexes the literature of nursing, biomedicine, health sciences librarianship, alternative/complementary medicine, consumer health and 17 allied health disciplines. **\$HMO**

Cochrane Database of Systematic Reviews <http://www.cochrane.org/>

Systematic reviews of primary research in human health care and health policy that investigate the effects of interventions for prevention, treatment, and rehabilitation. Internationally recognized as the highest standard in evidence-based health care. **\$HMO**

DynaMed <http://ebscohost.com/dynamed/>

Evidence-based summaries for over 3,500 topics that answer clinical questions occurring during practice. Updated daily; monitors the content of more than 500 medical journals and systematic evidence review databases. Includes drug and disease information. **\$HMO***

Medscape Nursing <http://www.medscape.com/nurses>

Point-of-care clinical reference featuring up-to-date, peer-reviewed medical reviews organized by specialty. **MO**

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<http://www.ebscohost.com/biomedical-libraries/the-cmahl-database>

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Medscape Nursing <http://www.medscape.com/nurses>

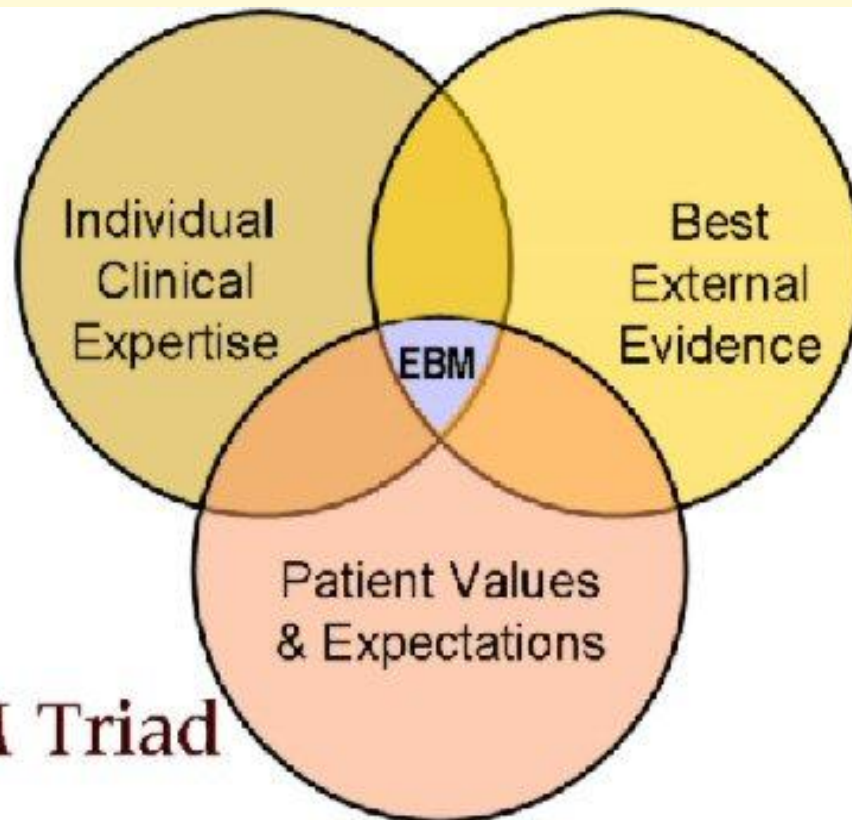
Point-of-care clinical reference featuring up-to-date, peer-reviewed medical reviews organized by specialty. **MO**

What is evidence-based practice?

- Evidence based medicine is the **conscientious, explicit, and judicious use of current best evidence in making decisions** about the care of individual patients.
- The practice of evidence based medicine means **integrating individual clinical expertise with the best available external clinical evidence** from systematic research.

Sackett DL et al. Evidence based medicine: what it is and what it isn't. *BMJ* 1996 Jan 13; 312 (7023): 71-2.

Evidence-Based Practice



The EBM Triad

Steps for EBN Practice

0. Cultivate a spirit of inquiry.
1. Convert your information into an answerable question (PICO)
2. Search the literature for the best available evidence
3. Critically appraise the evidence for validity and usefulness
4. Apply the findings to your clinical practice along with clinical expertise and patient's perspective to plan care
5. Evaluate the outcomes of your practice decisions or changes based on evidence
6. Disseminate EBP results

Melnyk BM, Fineout-Overholt E, Stillwell SB, Williamson KM. Evidence-based practice: step by step: the seven steps of evidence-based practice. *Am J Nurs* 2010 Jan;110(1):51-3

What makes good evidence?

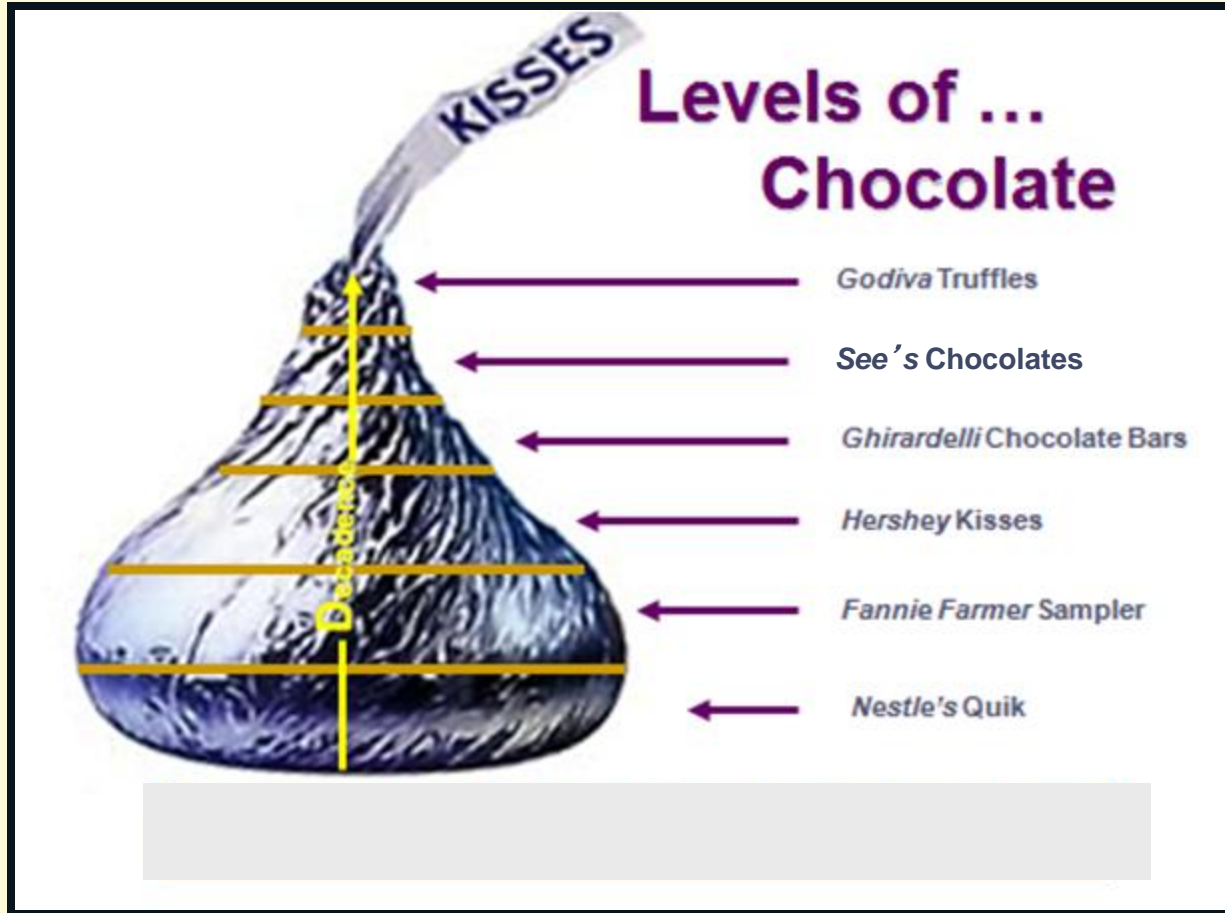
Good

- Based on scientific research
- RCT
- Systematic review
- Meta-analysis
- Clinical guidelines

Shoddy

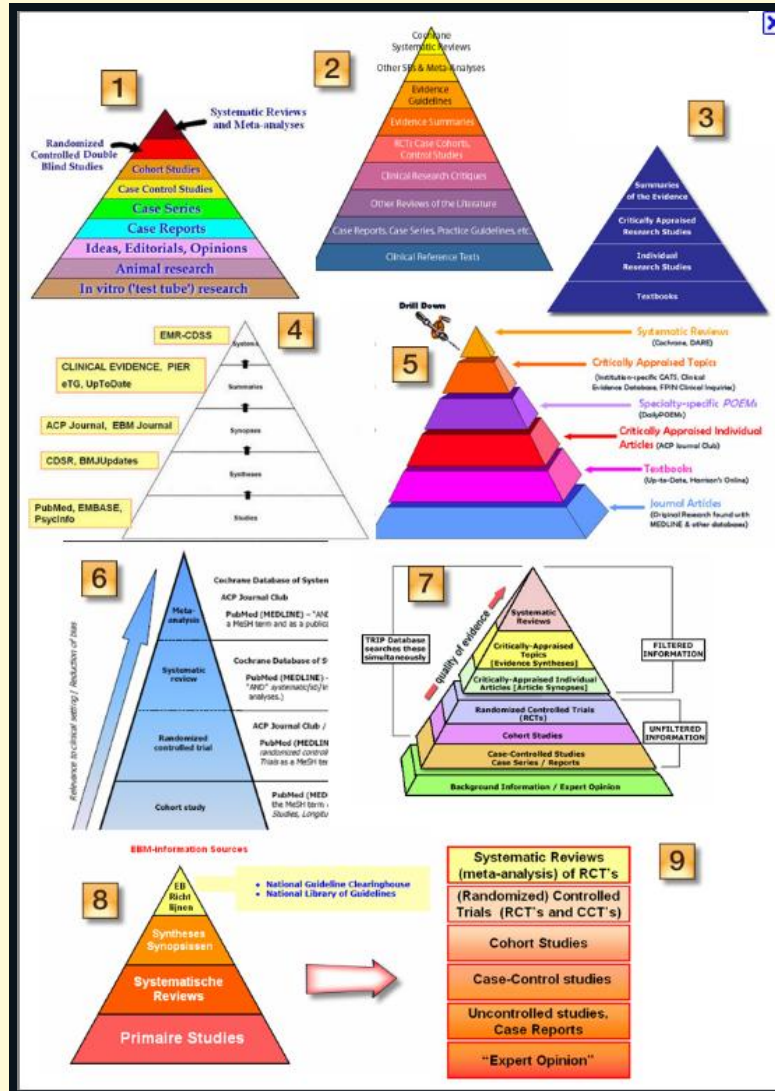
- Opinion
- Consensus
- Because it's been done this way for 100 years

Chocolate Decadence Pyramid

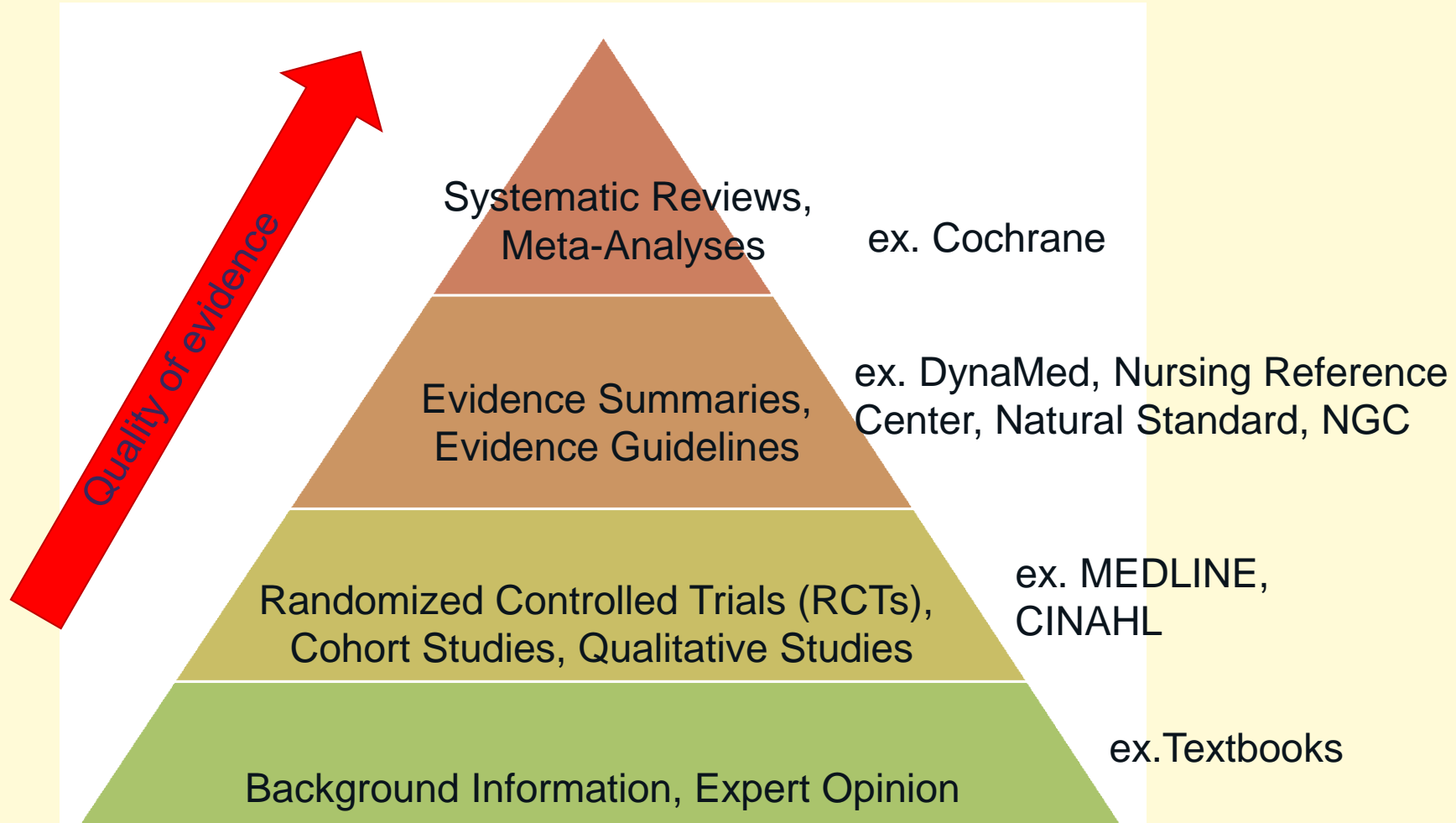


Slide adapted from Edward G. Miner Library, University of Rochester School of Medicine and Dentistry

Lots of Evidence Pyramids!



Evidence Pyramid

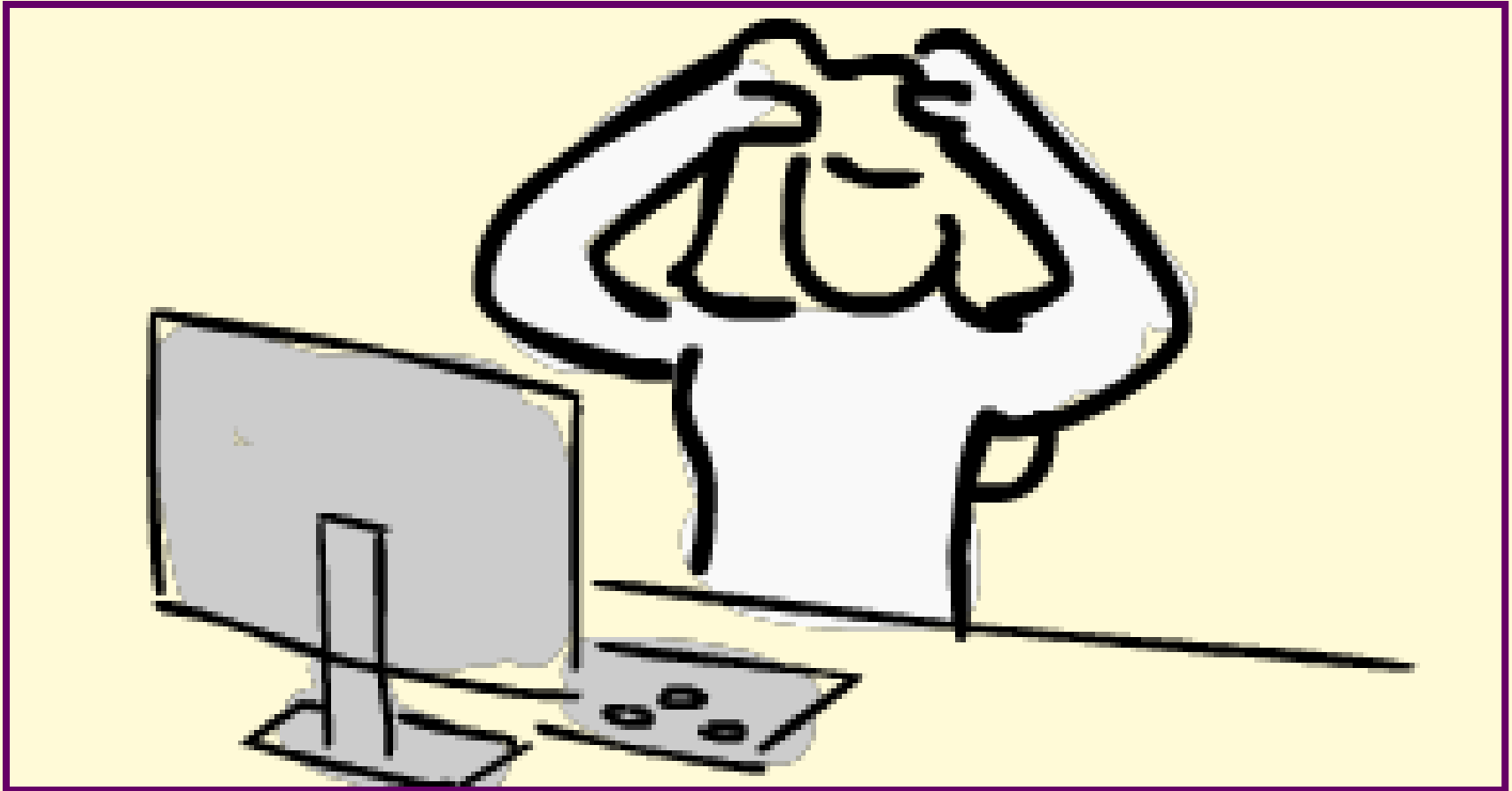


Case Scenario

Mrs. Hernandez, a 45 year-old Spanish speaking woman, has been recently diagnosed with **Diabetes Type 2**.

- She presents in your clinic with uncontrolled **hypertension**.
- Prescribed **medications** include Lisinopril, Clonidine, and Metformin.
- She takes **fenugreek**.
- You notice a suspicious **rash** on her arms.
- She would like some **patient information** for her family and herself.

Where to look for evidence-based information?



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Need: Current evidence-based information
on treating hypertension in diabetic patients

Nursing Reference Center

- **Point-of-care EBP nursing resource**
- Evidence-based summaries on key topics incorporating the best available evidence through rigorous systematic surveillance
- Includes full-text journals and texts
- Obviously aimed at nurses
- **Also includes:** Practice Guidelines; Skills and Procedures; Skill Competency Checklists; Drug Information; Patient Education materials; Continuing Education, and more
- **M:** Available on mobile devices

Nursing Reference Center

- Basic Search
- Diseases & Conditions**
- Skills & Procedures
- Drug Information
- Patient Education
- Practice Resources
- Continuing Education

Browse for: in 

Alphabetical **Relevancy Ranked**


1-50 of 520 ▶

- [Hypertension and Diabetes Mellitus](#)
- [Diabetes Mellitus, Type 2: Hypertension Risk](#) 
- [Diabetes Mellitus, Hypertension, and Heart Disease](#)
- [Type 2 Diabetes Mellitus: Hypertension Risk](#) 
- [Stable Diabetes Mellitus: Hypertension Risk](#) 
- [Non-Insulin-Dependent Diabetes Mellitus: Hypertension Risk](#) 
- [Hypertension, Diabetes, and Heart Disease](#)
- [Hypertension Risk: Type 2 Diabetes Mellitus](#) 
- [Hypertension Risk: Stable Diabetes Mellitus](#) 
- [Hypertension Risk: Non-Insulin-Dependent Diabetes Mellitus](#) 
- [Hypertension Risk: Adult Onset Diabetes Mellitus](#) 



Key Content

Diseases & Conditions includes:

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

NRC Quick Lesson

QUICK LESSON

Hypertension and Diabetes Mellitus

Description/Etiology

Diabetes mellitus (DM) is a chronic condition characterized by hyperglycemia (HTN), and the risk of developing HTN is increased in patients with DM. HTN is defined as a systolic BP of 140 mm Hg or higher or a diastolic BP of 90 mm Hg or higher. DM and HTN are frequently present together, and both conditions are associated with increased risk of cardiovascular disease.

In patients with DM and HTN, the presence of nephropathy, albuminuria, and low levels of insulin, which is a result of insulin resistance, may stimulate the sympathetic nervous system and vascular remodeling.

The two treatment goals for patients with DM and HTN are to achieve both goals; other potential goals include maintaining glucose levels and reducing cardiovascular disease risk.

For patients who cannot achieve these goals, combination drug therapy is common.

Facts and Figures

The prevalence of HTN in patients with DM is attributed to the high prevalence of HTN in this population.

Risk Factors

Both HTN and DM are the most common chronic conditions with both HTN and DM alone. HTN and DM are associated with a higher risk of cardiovascular disease. Risk factors for HTN include family history, obesity, excess sodium intake, stress, physical inactivity, and excessive alcohol use. Men, Blacks, and older adults are at increased risk for developing

Signs and Symptoms/Clinical Presentation

Signs and symptoms of DM1 and DM2 include increased thirst, weight loss, and blurred vision. DM2 patients may present with headache, hematuria, exudate, arteriolar narrowing, small infarction).

Assessment

► Patient History

• Assess risk factors and patient/family history of DM and HTN

► Physical Findings of Particular Interest

• Patients with DM and HTN may have orthostatic BP changes; take at least 2 readings that are 5 minutes apart

► Laboratory Tests That May Be Ordered

• Fasting blood glucose levels may be abnormal (> 125 mg/dL) if adherence to the prescribed treatment regimen for DM is poor
• Serum chemistry analysis may show elevated levels of BUN and creatinine
• UA may show hematuria or proteinuria in patients with renal disease

► Other Diagnostic Tests/Studies

• EKG may show the presence of left ventricular hypertrophy or ST-T changes
• Chest X-ray may show enlargement of the heart
• Cranial CT scan may identify evidence of stroke

Treatment Goals

► Promote Optimum Physiologic Status and Reduce Risk of Complications

• Monitor vital signs (especially frequent monitoring of BP), respiratory, renal, and neurologic status for complications of DM; report abnormalities and treat, as ordered

• Administer prescribed antihypertensive agents such as ACE inhibitors (e.g., chlorthalidone), and/or calcium channel blockers (e.g., amlodipine), as ordered

• Administer oral antidiabetic agents or insulin, as ordered; monitor glucose levels

• Educate regarding consuming a heart-healthy diet restricted in sodium and fat; refer to a registered dietitian for patient evaluation and education re: diet

► Provide Emotional Support and Educate

• Assess the patient's anxiety level, coping ability, and for knowledge; provide support, educate, and encourage discussion about DM and HTN risks and benefits, lifestyle modification (for details, see *W/0000*)
• Provide individualized prognosis

Renal nerve denervation (RDN), a catheter-based therapy in which radiofrequency pulses are applied to the renal arteries to interrupt nerve impulses and reduce renal sympathetic activity, has been shown to be a promising treatment for resistant HTN. New data suggest that in addition to a decrease in BP, RDN has positive effects on glucose metabolism, including a decrease in hemoglobin A1C levels and improvement in hemoglobin A1C levels. RDN might prove to be a valuable tool in the treatment of HTN and DM that is resistant to more conventional treatments (Hering et al., 2012)

Red Flags

► Prehypertension (i.e., systolic BP 120–139 mm Hg and/or diastolic BP 80–89 mm Hg), white-coat HTN (i.e., a condition in which an individual's otherwise normal BP becomes elevated when measured in a healthcare setting), and masked HTN (i.e., a condition in which BP is normal in the healthcare setting but elevated in daily life) are all associated with increased risk for developing DM

What Do I Need to Tell the Patient/Patient's Family?

► Emphasize the importance of strict adherence to the prescribed treatment regimen to reduce risk of complications, regular in-home BP and glucose monitoring, and continued medical surveillance to evaluate the efficacy of treatment
► Educate about the signs and symptoms of potential adverse effects of pharmacologic therapy (e.g., ACE inhibitors and ARBs can cause angioedema; direct the patient to seek immediate medical attention for new or worsening signs and symptoms)
► Educate that beta-blockers and thiazides have the potential to worsen glycemic control, and patients receiving these medications should be vigilant in monitoring blood glucose levels and reporting poor glycemic control to their clinician because their prescribed HTN medications might need to be adjusted and/or blood glucose-lowering medications may need to be added to the prescribed regimen
► Advise that hypotension can develop as a result of antihypertensive therapy; to reduce the risk for falling, the patient should sit up or stand up slowly and use supportive devices for stabilization
► Educate that high BP may be present without any apparent symptoms and that lifestyle modifications can help control BP and DM, including eating a low-salt and low-sugar diet, limiting alcohol intake, exercising, and reducing stress
► Educate regarding the importance of lifestyle modifications, particularly making dietary changes (e.g., following the DASH diet)

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NRC Evidence Based Care Sheet

EVIDENCE-BASED CARE SHEET

Diabetes Mellitus, Type 2: Hypertension Risk

What We Know

- › Diabetes is the leading cause of the development of chronic kidney disease (CKD) in the United States. Greater access to care and better management of chronic kidney disease (CKD) is needed.
 - HTN is a major risk factor for CKD in the general population.
 - HTN is a leading cause of CKD (1,2,3,5,6,7,11).
 - Among patients with DM2, HTN is a leading cause of CKD (1,2,3,5,6,7,11).
 - › In patients with DM2, HTN, beta blockers have been shown to reduce pancreatic insulin secretion (7).
 - Hyperglycemia, HTN, and dyslipidemia are major contributors to the development of atherosclerosis and decrease in HDL cholesterol levels.
 - Insulin resistance is involved in the development of atherosclerosis.
 - Insulin resistance is associated with dyslipidemia (HDL cholesterol, triglycerides).
 - › Treatment for coexisting DM2 and HTN should be individualized, specializing in internal medicine, or nephrology.
 - The treatment plan for patients with DM2 and HTN should include (e.g., antidiabetics, antihypertensives, statins, and lifestyle changes) (5,7,11).
 - Although exercise has been shown to improve glycemic control in those with DM2, supervised exercise 3 times per week for 12 weeks reduced stiffness in patients with DM2 (8).

- › DM2 and HTN are common comorbidities.
 - HTN is a leading cause of CKD in the United States.
 - Diabetes is a leading cause of CKD in the United States.
 - Research is needed to determine the association between DM2 and HTN.
 - › Most current guidelines recommend a lower target BP goal for diabetic patients (1,2,3,5,6,7,11).

What We Can Do

- › Learn about DM2, HTN, and the personal characteristics and health status of your patients with DM2 and HTN.
 - Encourage your patients with DM2 and HTN to engage in physical activity, CVD, CBVD, peripheral vascular disease, and kidney disease (1,2,3,5,6,7,11).
 - › Educate patients with DM2 and HTN about the importance of adhering to their treatment regimens for themselves and their families (2).
 - Emphasize the importance of weight management and the capacity to excrete sodium, which is essential to prevent complications of DM2 and HTN (1,2,3,5,6,7,11).
 - › Inform patients with DM2 about the side effects of antihypertensive agents and to report symptoms so that their treatment can be adjusted to increase the chance of adherence to treatment regimens (1,2,3,5,6,7,11).

Coding Matrix

References are cited using the following codes, listed in order of strength:

M Published meta-analysis	RR Published review of the literature	PP Policies, procedures, protocols
SR Published systematic or integrative literature review	RU Published research utilization report	X Practice exemplars, stories, opinions
RCT Published research (randomized controlled trial)	QI Published quality improvement report	GI General or background information/abstracts/reports
R Published research (not randomized controlled trial)	L Legislation	U Unpublished research, reviews, poster presentations or other such materials
C Case histories, case studies	PGR Published government report	CP Conference proceedings, abstracts, presentation
G Published guidelines	FFR Published funded report	

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NRC Nursing Practice & Skill

NURSING PRACTICE & SKILL

Blood Pressure Reading, Indirect: Taking – Adult Patient

What Is Taking an Indirect Blood Pressure Reading in an Adult?

- Blood pressure (BP) is a measure of the pressure exerted by circulating blood upon the walls of blood vessels. BP results from two forces: the pressure created by the heart as it contracts to pump blood into the arteries through the circulatory system, and the force of the arteries as the vessel walls resist the pumping pressure of the heart.
- **IF/AC** BP is measured in millimeters of mercury (mm Hg) in the United States, and by the International System of Units (SI) in most countries outside the U.S. BP readings are comprised of two numbers, the systolic BP (i.e., the force of the heart contracting during systole) and the diastolic BP (i.e., the pressure of the blood relaxes between beats [diastole]), which is a function of blood volume and the size, elasticity, and resistance of the body's blood vessels against the heart's contractions.
- **IF/AC** BP readings can be taken indirectly by using a manual mercury or aneroid (non-fluid based) sphygmomanometer or an automated BP device, or directly by arterial cannulation. This Nursing Practice Alert focuses on indirect BP measurement in adult using both the manual and automated methods.
- **IF/AC** BP is measured in all areas where patient care is rendered.
- **IF/AC** Manual indirect BP measurement requires specialized training in order to properly evaluate the sounds, the tapping sounds made by the blood flowing through the arteries during compression of the cuff of the sphygmomanometer. Indirect BP measured by an automated machine can be performed with training by the patient and non-medical personnel.

What is the Desired Outcome of Taking an Indirect Blood Pressure Reading in an Adult?

- BP measurement can
 - assess a patient's general cardiovascular function
 - determine a patient's baseline BP for use as a reference point in interpreting future BP measurements
 - determine if an individual is hypertensive, indicated by elevated BP levels
 - monitor the effect of antihypertensive medications
 - determine if an individual is hypotensive, indicated by low BP, which could be the result of various conditions (e.g., dehydration, hemorrhage, infection, neurogenic injury)
- assist in determining the appropriate level of exercise. Measuring BP during exercise is useful in evaluating the stress placed on the heart during exertion and can be a valuable gauge in establishing an effective exercise program.

Why Is Taking an Indirect Blood Pressure Readings in an Adult Important?

- BP is one of the four cardinal vital signs of health (i.e., the measures of physiological status that assess basic functions [e.g., blood pressure, body temperature, heart rate, respiratory rate]). Monitoring BP is one way of evaluating the stress on the cardiovascular system, which has a global impact on the body.
- Untreated hypotension may cause dizziness, fainting, and organ damage.
- Potential complications of untreated hypertension included myocardial infarction, stroke, heart failure, and chronic kidney disease.

Facts and Figures

- BP can be affected by age, weight, pregnancy, pain, dietary salt intake, overall level of fitness, genetic predisposition, disease processes (e.g., kidney disease, thyroid disease), use of alcohol or drugs, and cigarette smoking. BP varies slightly throughout the day (Alexia, 2010).
- In the U.S., BP in adults is classified as follows: (Chobanian et al., 2003)
 - Normal: systolic BP < 120 mm Hg and diastolic BP < 80 mm Hg
 - Prehypertension: systolic BP 120–139 mm Hg and/or diastolic BP 80–89 mm Hg
 - Stage 1 hypertension: systolic BP 140–159 mm Hg and/or diastolic BP 90–99 mm Hg
 - Stage 2 hypertension: systolic BP ≥ 160 mm Hg or diastolic BP ≥ 100 mm Hg

order), then take two BP readings for baseline information. Once the patient rises to standing, take BP readings at 1 and 5 minutes to detect postural changes (for more information, see *Nursing Practice & Skill... Vital Signs, Postural Monitoring*)

- When auscultating Korotkoff sounds, the bell of the stethoscope may allow for better auscultation of low-pitched Korotkoff sounds (see *How To Take a Manual Indirect Blood Pressure Reading in an Adult*, below). Make sure to have a complete seal between the edge of the bell and the skin; avoid pressing too firmly which may obliterate the low-pitched Korotkoff sounds.
- Preliminary steps that should be performed before taking an indirect BP reading include the following:
 - Review the facility/unit specific protocol indirect for measurement of BP, if one is available
 - Review the treating clinician's order for measurement of BP
 - Review patient's medical history/medical record for previous readings and to determine if he or she has an irregular heart rhythm; if so, take a manual BP reading
 - Review the manufacturer's instructions for all equipment to be used, and verify that the equipment is in good working order
 - Review the patient's medical history/medical record for current medications, and any allergies (e.g., to latex, medications, or other substances); use alternative materials, as appropriate
- Gather supplies necessary for the procedure:
 - Facility-approved antiseptic wipes to disinfect equipment before/after patient contact
 - For manual BP, gather a sphygmomanometer and stethoscope; disinfect the surface of the stethoscope with an antiseptic wipe
 - For automated BP, gather an automated BP machine
 - An appropriately sized BP cuff

How To Take a Manual Indirect Blood Pressure Reading in an Adult

- Perform hand hygiene
- Identify the patient according to facility protocol
- Establish privacy by closing the door to the patient's room, and/or drawing the curtain surrounding the patient's bed
- Introduce yourself to the patient and family member(s), if present; explain your clinical role; assess the coping ability of the patient and family, for knowledge deficits, and anxiety regarding having his or her BP measured
- Determine if the patient/family requires special considerations regarding communication (e.g., due to illiteracy, language barriers, or deafness); make arrangements to meet these needs if they are present
 - Use professional certified medical interpreters, either in person or via phone, when language barriers exist
 - Explain the procedure for manual indirect BP measurement and its purpose; answer any questions and provide emotional support as needed
- Assist the patient into a seated or lying position with the arm that will be used to measure BP supported and positioned close to the level of the heart
- Advise the patient that he or she might feel minor discomfort as the BP cuff is inflated, and that automated cuffs may inflate more tightly than manual ones; reassure the patient that any discomfort caused by inflation of the BP cuff will be brief
- Prior to taking a manual BP reading, estimate the systolic BP. Wrap the appropriately-sized cuff snugly around the upper arm, about 2.5 cm (~1 inch) above the antecubital fossa, with the artery marking on the cuff aligned with the brachial artery. Feel the brachial or radial pulse with your fingertips. Inflate the cuff using your other hand and note the pressure reading at which the brachial or radial pulse is obliterated. Deflate the cuff and wait 30–60 seconds for any venous congestion caused by the cuff to dissipate before taking the BP reading
- Begin taking the BP reading by inflating the cuff to about 30 mm Hg higher than the systolic pressure you estimated by palpation. Inflate the cuff quickly, because slow inflation distorts the reading
- Place the bell or diaphragm of the stethoscope over the brachial artery. Listen for Korotkoff sounds as you slowly release the air from the cuff, so that the pressure drops by about 2–3 mm Hg at a time. Note: Some clinical resources recommend use of the bell over use of the diaphragm for auscultation of low-pitched arterial sounds, while others make no specific recommendation. For example, the American Heart Association recommended use of the bell for auscultating Korotkoff sounds in their 2004 guidelines (Pickering et al., 2005), while the American Association of Critical-Care Nurses (AACN) offered no specific recommendation for bell or diaphragm in their 2010 Practice Alert for noninvasive BP measurement (American Association of Critical-Care Nurses, 2010)
 - Note the pressure at which Korotkoff sounds are first heard as the systolic pressure
 - Note the pressure at which Korotkoff sounds cease as the diastolic pressure
- Advise the patient of the BP reading
- Alert the treating clinician of abnormal BP measurement (see **Red Flags**, below)
- Clean, disinfect, and store equipment, per facility protocol
- Perform hand hygiene
- Update the patient's plan of care, if appropriate, and document indirect BP measurement in the patient's medical record, including the following information:
 - Date and time of BP measurement
 - BP measurement and type of device used
 - Site used to obtain BP
 - Patient's position during the procedure
 - Patient/family member education, including topics presented, response to education provided/discussed, plan for follow-up education, and details regarding any barriers to communication and/or techniques that promoted successful communication

How To Take an Automated Indirect Blood Pressure Reading in an Adult

- **If the patient has an irregular heart rhythm, take a manual BP reading**
- Perform hand hygiene
- Identify the patient according to facility protocol
- Establish privacy by closing the door to the patient's room and/or drawing the curtain surrounding the patient's bed

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NRC Skill Competency Checklist

Standard Met/Initials	Competency Areas
	<i>Prerequisite Skills</i>
	<p>Knowledge that blood pressure (BP) is a measure of the pressure exerted by circulating blood upon the walls of blood vessels, resulting from:</p> <ul style="list-style-type: none"> • The pressure created by the heart as it contracts to pump blood into the arteries and through the circulatory system • The force of the arteries as the vessel walls resist the pumping pressure of the heart
	<p>Understanding that BP can be measured indirectly by two methods: using a manual mercury, aneroid (non-fluid-based) sphygmomanometer, or automated machine, and that use of a manual sphygmomanometer requires specialized training</p> <ul style="list-style-type: none"> • Understanding that use of a manual sphygmomanometer is necessary to accurately assess BP in individuals who have an irregular heart rhythm
	<p>Knowledge of common indications for BP measurement, such as:</p> <ul style="list-style-type: none"> • Assessment of the patient's general level of cardiovascular health • To determine patient's baseline BP for use as a reference point in interpreting future BP measurements • To determine if an individual is normotensive, hypertensive, or hypotensive • To assist in determining the appropriate level of exercise
	<p>Understanding of cardiovascular physiology as it relates to BP</p> <ul style="list-style-type: none"> • Knowledge of the events that can cause constriction or dilatation of blood vessels, and/or affect the heart rate • Knowledge of the cardiovascular events that occur during systole and diastole, and which produce systolic and diastolic BPs
	<p>Identification of conditions that should be met when taking an indirect BP reading (e.g., patient's legs should be uncrossed, patient should be reminded to refrain from talking, an appropriately sized BP cuff must be used)</p>
	<p>Understanding of how to accurately document BP in millimeters of mercury or International System of Units (SI), as appropriate</p>
	<i>Preparation</i>
	<p>Reviews the facility/unit specific protocol for indirect measurement of BP, if one is available</p>
	<p>Reviews the treating clinician's order for measurement of BP</p>
	<p>Reviews patient's medical history/medical record to determine if he or she has an irregular heart rhythm; if so, takes a manual BP reading</p>
	<p>Reviews the manufacturer's instructions for all equipment to be used, and verifies that the equipment is in good working order</p>
	<p>Reviews the patient's medical history/medical record for current medications, and any allergies (e.g., to latex, medications, or other substances); uses alternative materials, as appropriate</p>
	<p>Gathers supplies necessary for the procedure:</p> <ul style="list-style-type: none"> • Facility-approved antiseptic wipes to disinfect equipment before/after patient contact

High Blood Pressure

Contents

[Definition](#)[Causes](#)[Risk Factors](#)[Symptoms](#)[Diagnosis](#)[Treatment](#)[Lifestyle Changes](#)[Medications](#)[Prevention](#)

(Blood Pressure, High; Essential Hypertension; Idiopathic Hypertension; Primary Hypertension)

Definition

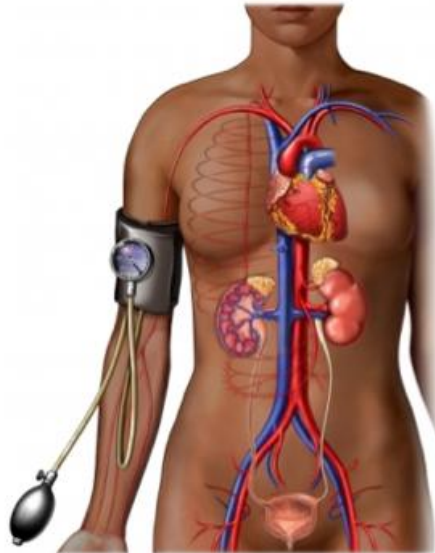
High blood pressure is *abnormally* high blood pressure with no known cause. Blood pressure measurements are read as two numbers:

- Systolic pressure: higher number, normal reading is 120 millimeters of mercury (mmHg) or less
- Diastolic pressure: lower number, normal reading is 80 mmHg or less

High blood pressure is defined as systolic pressure greater than 140 mmHg and/or diastolic pressure greater than 90 mmHg. You are considered [prehypertensive](#) if your systolic blood pressure is between 120-139 mmHg, or your diastolic pressure is between 80- 89 mmHg. Your doctor will recommend monitoring and lifestyle changes.

High blood pressure puts stress on the heart, lungs, brain, kidneys, and blood vessels. Over time, this condition can damage these organs and tissues.

Organs Impacted by High Blood Pressure



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Key Content



Diabetes Mellitus, Type 2

Tanja Schub, BS; Teresa-Lynn Spears, RN, BSN, PHN, AE-C; Helle Heering, RN, CRRN

**Quick Lesson
...about**

Diabetes Mellitus, Type 2

author(s)
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DynaMed

Need: Current evidence-based information on treating hypertension in diabetic patients

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- Monitors content of over 500 journals and systematic review databases
- **M**: Available on mobile devices



Hypertension treatment in patients with diabetes

- **Updated 2014 Mar 17 06:23:00 AM:** JNC 8 guideline on management of high blood pressure in adults (JAMA 2014 Feb 5) [view update](#)

Related Summaries:

- [Hypertension \(list of topics\)](#)
- [Diabetes \(list of topics\)](#)
- [Diabetes mellitus type 2](#)
- [Diabetic nephropathy](#)
- [Hypertension](#)
 - [Antihypertensive medications overview](#)
 - [First-line therapy for hypertension](#)
- [Cardiovascular risk prediction](#)
- [DASH diet](#)

Overview:

- [lifestyle modifications](#) which may lower blood pressure are recommended for patients with diabetes and blood pressure > 120/80 mm Hg and include ([ADA Grade B](#))
 - weight reduction
 - Dietary Approaches to Stop Hypertension (DASH) diet (fruits, vegetables, low-fat dairy, reduced fat)
 - dietary sodium restriction
 - aerobic physical activity
 - moderate alcohol consumption
- target blood pressure in patients with diabetes
 - [American Diabetes Association \(ADA\)](#) recommends goal blood pressure < 140/80 mm Hg ([ADA Grade B](#)) but

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Hypertension treatment in patients with diabetes

Target Blood Pressure Goals

Choice of Antihypertensive Agents

Section overview:

- o guidelines vary but generally recommend angiotensin-converting enzyme (ACE) inhibitor as part of initial therapy
- o most patients will require 2 or more drugs to achieve target blood pressure
- o 4 major antihypertensive classes (diuretics, beta blockers, ACE inhibitors, calcium channel blockers) appear to reduce cardiovascular mortality and morbidity in hypertensive patients with diabetes (level 2 [mid-level] evidence)
- o angiotensin receptor blockers (ARBs) may not reduce cardiovascular morbidity and mortality (level 2 [mid-level] evidence) but reduce risk for end-stage renal disease (level 1 [likely reliable] evidence)
- o all major antihypertensive regimens (ACE inhibitors, ARBs, calcium channel blockers, diuretics, beta blockers) appear to have similar short-term and medium-term effects on major cardiovascular events (level 2 [mid-level] evidence)
- o insufficient evidence to establish role for beta blockers as first-line therapy for hypertension in patients with diabetes
- o significant differences in specific cardiovascular outcomes reported in some randomized trials
 - ACE inhibitors may reduce risk for myocardial infarction more than calcium channel blockers in patients with diabetes (level 2 [mid-level] evidence)
 - ramipril (an ACE inhibitor) 10 mg/day (but not 1.25 mg/day) decreases mortality and cardiovascular outcomes in patients with diabetes (level 1 [likely reliable] evidence)
 - losartan (an ARB) reduces strokes (and total cardiovascular events) compared to atenolol (a beta blocker) as first-line therapy in high-risk patients (level 1 [likely reliable] evidence), but atenolol may be less effective than other antihypertensives
 - combination of perindopril plus indapamide (Preterax) reduces mortality in patients with type 2 diabetes (level 1 [likely reliable] evidence)
 - benazepril-amlodipine (Lotrel) reduces cardiovascular morbidity compared to benazepril-hydrochlorothiazide (Lotensin HCT) in high-risk patients with hypertension (level 1 [likely reliable] evidence)
- o in patients with diabetic nephropathy
 - ACE inhibitors may reduce risk for end-stage kidney disease (level 2 [mid-level] evidence), and ACE inhibitors at maximum tolerable dose (but not at lower doses) may reduce all-cause mortality (level 2 [mid-level] evidence)
 - ARBs may reduce risk for end-stage kidney disease in hypertensive patients with type 2 diabetes (level 2 [mid-level] evidence)
- o combination ACE inhibitor plus ARB does not reduce mortality or cardiovascular morbidity compared to ACE inhibitor alone (level 1 [likely reliable] evidence) and may worsen renal impairment despite greater efficacy for reducing blood pressure and urinary albumin excretion (level 3 [lacking direct] evidence)

Level of Evidence

Guideline recommendations:

- o **Seventh Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7)**⁽²⁾
 - most patients will require 2 medications to reach goal (< 130/80 mm Hg)
 - initial drug choices

- Goals
- Choice of Antihypertensive Agents
 - Section overview
 - Guideline recommendations
 - Comparisons of major drug classes vs. diuretics
 - Beta blockers
 - Angiotensin-converting enzyme (ACE) inhibitors
 - Angiotensin receptor blockers (ARBs)
 - Combination of ACE inhibitor plus ARB
 - Calcium channel blockers
 - Combination of perindopril plus indapamide
 - Combination of benazepril plus amlodipine

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- Combination of benazepril plus amlodipine
- Alpha blockers

hypertension diabetes

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Hypertension treatment in patients with diabetes

Level of Evidence

Angiotensin-converting enzyme (ACE) inhibitors:

- ramipril has cardiovascular benefits for patients with diabetes at 10 mg/day but not with 1.25 mg/day (level 1 [likely reliable] evidence)
 - ramipril 10 mg/day decreases mortality and cardiovascular outcomes in patients with diabetes and ≥ 1 additional cardiovascular risk factor (level 1 [likely reliable] evidence)
 - based on randomized trial (HOPE trial) and substudy (MICRO-HOPE)
 - 3,577 patients with diabetes with at least 1 other cardiovascular risk factor randomized to ramipril 10 mg/day vs. placebo for 5 years
 - trials stopped after 4.5 years due to benefits found in ramipril group
 - MICRO-HOPE substudy was preplanned evaluation within HOPE trial assessing development of overt nephropathy
 - comparing ramipril vs. placebo
 - 15.3% vs. 19.8% combined primary outcome (myocardial infarction, stroke, or cardiovascular death) (p = 0.0004, NNT 23)
 - 10.2% vs. 12.9% myocardial infarction (p = 0.01, NNT 37)
 - 4.2% vs. 6.1% stroke (p = 0.0074, NNT 53)
 - 6.2% vs. 9.7% cardiovascular death (p = 0.0001, NNT 29)
 - 10.8% vs. 14% total mortality (p = 0.004, NNT 32)
 - 9.4% vs. 10.5% laser therapy for retinopathy (not significant)
 - 0.5% vs. 0.5% dialysis (not significant)
 - 15.1% vs. 17.6% overt nephropathy based on proteinuria (p = 0.036, NNT 40)
 - 37% vs. 37% stopped drug at any time
 - 7% vs. 2% stopped drug due to cough (NNH 20)
 - Reference - HOPE and MICRO-HOPE trials (Lancet 2000 Jan 22;355(9200):253 [EBSCOhost Full Text](#)), correction can be found in Lancet 2000 Sep 2;356(9232):860, editorial can be found in Lancet 2000 Jan 22;355(9200):246 [EBSCOhost Full Text](#), considerable commentary can be found in Lancet 2000 Apr 1;355(9210):1181
 - see HOPE trial for additional details
 - ramipril 1.25 mg/day not effective for preventing cardiovascular outcomes or progression to end-stage renal disease (level 1 [likely reliable] evidence)
 - based on randomized trial
 - 4,912 patients > 50 years old with type 2 diabetes and urinary albumin excretion at least 20 mg/L on 2 consecutive samples and serum creatinine < 150 mcmol/L (1.7 mg/dL) were randomized to ramipril 1.25 mg vs. placebo orally once daily for 3-6 years
 - no significant difference in combined outcome of cardiovascular death, nonfatal myocardial infarction, stroke, hospital admission for heart failure, and end-stage renal failure
 - no significant differences in any of these outcomes individually
 - Reference - BMJ 2004 Feb 28;328(7438):495 full-text, correction can be found in BMJ 2004 Mar 20;328(7441):686, commentary can be found in BMJ 2004 Apr 24;328(7446):1016 full-text
- ACE inhibitors may reduce risk for myocardial infarction more than calcium channel blockers in patients with diabetes (level 2 [mid-level] evidence)
 - based on 2 randomized trials with limitations
 - calcium channel blocker **nisoldipine** associated with increased risk of myocardial infarction compared to angiotensin-converting enzyme (ACE) inhibitor **enalapril** in patients with hypertension and type 2 diabetes (level 2 [mid-level] evidence)
 - based on randomized trial with difference in use of supplemental antihypertensive agents
 - 470 patients aged 40-74 years with type 2 diabetes, diastolic blood pressure > 90 mm Hg, and no antihypertensive medications were randomized to intensive vs.



Level of Evidence





Hypertension treatment in patients with diabetes

Guidelines:

- see [Hypertension](#) for full list of guidelines

United States guidelines:

- American Diabetes Association (ADA) position statement on standards of medical care in diabetes can be found in [Diabetes Care 2013 Jan;36 Suppl 1:S11 full-text](#), executive summary can be found in [Diabetes Care 2013 Jan;36 Suppl 1:S4 full-text](#)
- National Kidney Foundation Kidney Disease Outcomes Quality Initiative (NKF KDOQI) clinical practice recommendations for diabetes and chronic kidney disease can be found at [NKF KDOQI 2007](#) (unchanged in [KDOQI 2012 update PDF](#))
- American Society of Hypertension (ASH) position on treatment of hypertension in patients with diabetes can be found in [J Clin Hypertens \(Greenwich\) 2008 Sep;10\(9\):707](#)  **EBSCOhost Full Text** 
- Cincinnati Children's Hospital Medical Center (CCHMC) Best evidence statement (BEST) on screening of hypertension in pediatric patients with diabetes can be found at [CCHMC](#) or at [National Guideline Clearinghouse 2011 Nov 7:33572](#), [National Guideline Clearinghouse 2012 :34038](#)
- American Association of Clinical Endocrinologists (AACE) medical guideline on developing diabetes mellitus comprehensive care plan can be found in [Endocr Pract 2011 Mar-Apr;17 Suppl 2:1](#) or at [National Guideline Clearinghouse 2011 Nov 14:34038](#), commentary can be found in [Endocr Pract 2011 Sep 1;17\(5\):829](#)
- American Heart Association/American Diabetes Association (AHA/ADA) statement on primary prevention of cardiovascular diseases in people with diabetes can be found in [Circulation 2007 Jan 2;115\(1\):114 full-text](#)
- American Heart Association/American College of Cardiology Foundation (AHA/ACCF) guideline on secondary prevention and risk reduction therapy for patients with coronary and other atherosclerotic vascular disease can be found in [Circulation 2011 Nov 29;124\(22\):2458 full-text](#), [J Am Coll Cardiol 2011 Nov 29;58\(23\):2432](#), previous version can be found in [Circulation 2006 May 16;113\(19\):2363 full-text](#)
- American College of Physicians (ACP) guideline on treatment of hypertension in patients with type 2 diabetes can be found in [Ann Intern Med 2003 Apr 1;138\(7\):587](#)  **EBSCOhost Full Text**, supporting evidence-based review in [Ann Intern Med 2003 Apr 1;138\(7\):593](#)  **EBSCOhost Full Text**, commentary can be found in [Ann Intern Med 2004 Mar 16;140\(6\):487](#)  **EBSCOhost Full Text**
- Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure seventh report (JNC7) can be found in [Hypertension 2003 Dec;42\(6\):1206 full-text](#), [JNC 7 report 2004 Aug PDF](#), [Reference Card](#), [Express Report](#)
 - summary can be found in [JAMA 2003 May 21;289\(19\):2560](#), correction can be found in [JAMA 2003 Jul 9;290\(2\):197](#), considerable commentary can be found in [JAMA 2003 Sep 10;290\(10\):1312](#)
 - summary can be found in [Am Fam Physician 2003 Jul 15;68\(2\):376](#), editorial can be found in [Am Fam Physician 2003 Jul 15;68\(2\):228](#)

target blood pressure in patients with diabetes

- American Diabetes Association (ADA) recommends goal blood pressure < 140/80 mm Hg (ADA Grade B) but

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

Treatment of hypertension in patients with diabetes mellitus

Treatment of hypertension in patients with diabetes mellitus

TOPIC OUTLINE

SUMMARY & RECOMMENDATIONS

INTRODUCTION AND PREVALENCE

PATHOGENESIS

- Hyperinsulinemia
- Volume expansion
- Increased arterial stiffness

BENEFIT OF TREATMENT

- UKPDS trial
- HOT trial
- ADVANCE trial

GOAL BLOOD PRESSURE

- Normotensive ABCD trial
- ACCORD BP trial
- SANDS trial

- Trials of angiotensin inhibition
- Summary and conclusions

CHOICE OF ANTIHYPERTENSIVE DRUGS

- ALLHAT trial
- Thiazide diuretics
- Angiotensin inhibitors
 - ACE inhibitors
 - Angiotensin II receptor blockers
 - ACE inhibitor plus ARB
- Calcium channel blockers
- Beta blockers
- Alpha blockers
- Combination therapy and ACCOMPLISH

- Calcium channel blockers
- Beta blockers
- Alpha blockers
- Combination therapy and ACCOMPLISH

SUMMARY AND RECOMMENDATIONS

- Choice of antihypertensive agents
- Goal blood pressure

REFERENCES

Treatment of hypertension in patients with diabetes mellitus

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All topics are updated as new evidence becomes available and our peer review process is complete. Literature review current through: Mar 2014. | This topic last updated: Jan 22, 2014.

INTRODUCTION AND PREVALENCE — Hypertension is a common problem in patients with both type 1 and type 2 diabetes but the time course in relation to the duration of diabetes is different [1-3]. Among those with type 1 diabetes, the incidence of hypertension rises from 5 percent at 10 years, to 33 percent at 20 years, and 70 percent at 40 years [2]. There is a **close relation** between the prevalence of hypertension and increasing albuminuria. The blood pressure typically begins to rise within the normal range at or within a few years after the onset of moderately increased albuminuria (the new term for what was previously called "microalbuminuria" [4]) and increases progressively as the renal disease progresses. (See "[Moderately increased albuminuria \(microalbuminuria\) in type 1 diabetes mellitus](#)", section on 'Risk factors'.)

These features were illustrated in a study of 981 patients who had type 1 diabetes for five or more years [3]. Hypertension was present in 19 percent of patients with normoalbuminuria, 30 percent with high albuminuria, and 65 percent with severely increased albuminuria (the new term for what was previously called "macroalbuminuria" [4]). The incidence of hypertension eventually reaches 75 to 85 percent in patients with progressive diabetic nephropathy [5]. The risk of hypertension is highest in blacks, who are also at much greater risk for renal failure due to diabetic nephropathy. (See "[Overview of diabetic nephropathy](#)".)

The findings are different in patients with type 2 diabetes. In a series of over 3500 newly diagnosed patients, 39 percent were already hypertensive [6]. In approximately one-half of these patients, the elevation in blood pressure (BP) occurred **before** the onset of moderately increased albuminuria. Hypertension was strongly associated with obesity and, not surprisingly, the hypertensive patients were at increased risk for cardiovascular morbidity and mortality. (See "[Moderately increased albuminuria \(microalbuminuria\) in type 2 diabetes mellitus](#)".)

This topic will review the pathogenesis of hypertension in patients with diabetes mellitus and the three major treatment issues:

- The evidence supporting benefit from the treatment of hypertension
- The choice of antihypertensive drugs
- The goal blood pressure

PATHOGENESIS — In addition to the development of diabetic nephropathy, at least three other factors have been proposed to contribute to hypertension in diabetes: hyperinsulinemia, extracellular fluid volume expansion, and increased arterial stiffness.

Hyperinsulinemia — Hyperinsulinemia, due to insulin resistance in type 2 diabetes or to insulin administration, may increase systemic blood pressure. In one report of 80 type 2 diabetic patients begun on insulin, the blood pressure rose from 132/81 to 148/89 mmHg [7]. This hypertensive response,

SUMMARY AND RECOMMENDATIONS — The prevalence and time of development of hypertension in patients with diabetes mellitus varies with the type of diabetes. (See ['Introduction and prevalence'](#) above.)

- Among patients with type 1 diabetes, the incidence of hypertension rises from 5 percent at 10 years' duration, to 33 percent at 20 years, and 70 percent at 40 years. The blood pressure typically begins to rise within the normal range at or within a few years after the onset of moderately increased albuminuria (formerly "microalbuminuria") and increases progressively as the renal disease progresses.
- Among patients with type 2 diabetes, as many as 40 percent are hypertensive at the time of diagnosis and, in approximately one-half of these patients, the elevation in blood pressure occurred **before** the onset of moderately increased albuminuria.

Choice of antihypertensive agents — The choice of antihypertensive agents in diabetic patients is based upon their ability to prevent adverse cardiovascular events and to slow progression of renal disease, if present. The choice is not based upon retinopathy end points since comparative trials have not demonstrated superiority of one agent over another for retinopathy. (See ["Prevention and treatment of diabetic retinopathy"](#), section on ['Antihypertensive therapy'](#).)

- In the ALLHAT trial, diabetic patients had a significantly lower rate of new onset heart failure with low-dose [chlorthalidone](#) compared to [amlodipine](#) and [lisinopril](#). This effect may have been due at least in part to a lower attained blood pressure with chlorthalidone. (See ['ALLHAT trial'](#) above.)
- In the ACCOMPLISH trial, the combination of an ACE inhibitor and [amlodipine](#) provided better protection against cardiovascular outcomes in diabetic patients than the combination of an ACE inhibitor and low-dose [hydrochlorothiazide](#). (See ['Combination therapy and ACCOMPLISH'](#) above.)
- ACE inhibitors and ARBs protect against the development of progressive nephropathy due to type 1 and 2 diabetes. (See ["Treatment of diabetic nephropathy"](#) and ["Moderately increased albuminuria \(microalbuminuria\) in type 1 diabetes mellitus"](#) and ["Moderately increased albuminuria \(microalbuminuria\) in type 2 diabetes mellitus"](#).)

An ACE inhibitor or ARB is clearly preferred as initial therapy in any hypertensive diabetic patient who has moderately increased albuminuria (formerly "microalbuminuria") or severely increased albuminuria (formerly "macroalbuminuria") in an attempt to slow renal disease progression. Most experts will also begin with an ACE inhibitor or ARB in hypertensive diabetic patients without proteinuria. This is unlikely to occur in patients with type 1 diabetes in whom moderately increased albuminuria typically precedes hypertension.

Although ALLHAT found some better outcomes with low-dose [chlorthalidone](#), this effect could have been related to the lower attained

Hyperinsulinemia — Hyperinsulinemia, due to insulin resistance in type 2 diabetes or to insulin administration, may increase systemic blood pressure. In one report of 80 type 2 diabetic patients begun on insulin, the blood pressure rose from 132/81 to 148/89 mmHg [7]. This hypertensive response,

Natural Standard

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Fenugreek (*Trigonella foenum-graecum*)

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Synonyms/Common Names/Related Substances:

1-methylnicotinic acid, 3-carboxy-1-methyl pyridinium, 3-O-alpha-L-rhamnosyl quercetin, 4-hydroxyisoleucine (4-OH-Ile), 5,7,3'-hydroxy-5'-methoxylisoflavone, abish (Amharic), alholva (Spanish), alkaloids, amber, [beta-carotene](#), betaines, beta-sitosteryl glucopyranoside, biochanin A, bird's foot, bockhornsklöver (Swedish), Bockshornsamen (German), Bockshornklee (German), calycosin, Canadian fenugreek seed, Canadian-grown fenugreek, carotenoids, çemen (Turkish), chilbe, CN 19062, CN 19067, CN 19070, CN 19071, coumarin, D-3-O-methyl-chiroinsitol, daidzein, dioscin, diosgenin, ethyl-alpha-D-glucopyranoside, Fabaceae, fatty acids, fenegriek, fenigreko, fenogreco (Galician, Spanish), fenogrego, fenugree, fenugreek flour, fenugreek gums, fenugreek leaves, fenugreek saponin I, fenugreek seed, fenugreek spouts, FenuLife®, fenu-thyme, fieno greco (Italian), flavonoids, *Foenugraeci* semen, formononetin, furostanol glycosides, galactomannan, gamma-schizandrin, gitogenin 3-O-alpha-L-rhamnopyranosyl-(1-->2)-beta-D-glucopyranoside, gitogenin 3-O-beta-D-xylopyranosyl-(1-->6)-beta-D-glucopyranoside, görögszéna (Hungarian), graine de fenugrec (French), gray hay, Greek hay, Greek hay seed, griechische Heusamen (German), halba (Malay), hilbeh (Arabic, Hebrew), hulba (Arabic), hu lu ba, irilone, [iron](#), kaempferol 3,7-O-alpha-L-dirhamnoside, kaempferol-3-O-alpha-L-rhamnoside, kasoori methi (Hindi, Urdu), kozieradka pospolita (Polish), kreeka lambalääts (Estonian), lectins, mente (Kannada), mentikura (Telugu), mentulu (Telugu), methi (Assamese, Bengali, Dogri, Gujarati, Hindi, Maithili, Marathi, Nepali, Oriya, Punjabi, Urdu), methika (Sanskrit), methini, methri, methro, methylnicotinic acid, methyl-protodeltonin, methyl-protodioscin, minerals, mithi guti (Assamese), N-methyl nicotinic acid, N,N'-dicarbazyl, naringenin, niacin, nicotinic acid, orientin-2"-O-p-trans-coumarate, pazhitnik grecheskiy (Russian), penantazi (Burmese), phenolic acids, protodioscin, quarto, quercetin, quercetin 3,7-O-alpha-L-dirhamnoside, riboflavin, sag methi (Hindi), shambala, sapogenins, saponins, sarsasapogenin, sarsasapogenin 3-O-beta-D-xylopyranosyl-(1-->6)-beta-D-glucopyranoside, sarviapila (Finnish), scopoletin, shabaliidag (Pahlavi), shanbelile (Farsi), smilagenin, sotolone, star fenugreek, syndrex, tricin, tricin-7-O-beta-D-glucopyranoside, trigonella, *Trigonella*, *Trigonella balansae*, *Trigonella caerulea*, *Trigonella foenum-graecum*, *Trigonella poenumgraecum* L., *Trigonella* semen, *Trigonella stellata*, trigonelline, trigoneoside Xa, trigoneoside Xb, trigoneoside Xlb, trigoneoside Xlla, trigoneoside Xllb, trigoneoside Xllla, uluhl (Sinhala), uwatu (Sinhala)



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Synonyms

- 1-methyl-5-hydroxytryptophan
- 1-methyl-5-hydroxytryptophan glucopyranoside
- 1-methyl-5-hydroxytryptophan calycoside
- 19070, 0
- fatty acid
- leaves, t
- Foenugreek*
- L-rhamnose
- görogysz
- halba (M
- 3-O-allyl
- (Kannada
- Punjabi,
- minerals
- coumarin
- alpha-L-
- D-xylopy
- smilagine

Clinical Bottom Line/Effectiveness

Brief Background:

- Fenugreek is a plant in the family Fabaceae. Both the leaves and the seeds are commonly used. Fenugreek is produced in Asia, the Middle East, South America, and southern Europe. Fenugreek seeds are often used in the making of *garam masala* (South Asian spice blend).
- Fenugreek has a long history of medicinal uses in Indian and Chinese medicine and has been used for numerous indications, including labor induction and aiding digestion, and as a general tonic to improve metabolism and health.
- Preliminary animal and methodologically weak human trials have suggested possible hypoglycemic and antihyperlipidemic properties of oral fenugreek seed powder. Preliminary trials have also studied the use of fenugreek as a galactagogue, and for exercise performance enhancement, head lice, obesity, and skin care. However, at this time, the evidence is not sufficient to draw further conclusions regarding the use of fenugreek for these indications.
- Caution is warranted in patients concurrently taking fenugreek and hypoglycemic agents, in whom blood glucose levels should be monitored. Hypokalemia has also been reported, and potassium levels should be followed in patients taking concomitant hypokalemic agents and those with underlying cardiac disease.

Scientific Evidence for Common/Studied Uses:

Indication	Evidence Grade	
Diabetes mellitus type 2	B	 Grading System
Diabetes mellitus type 1	C	
Exercise performance enhancement	C	
Galactagogue	C	
Head lice	C	
Hyperlipidemia	C	
Obesity	C	

Trigonella caerulea, *Trigonella foenum-graecum*, *Trigonella poenumgraecum* L., *Trigonella semen*, *Trigonella stellata*, trigonelline, trigoneoside Xa, trigoneoside Xb, trigoneoside Xlb, trigoneoside Xlla, trigoneoside Xllb, trigoneoside Xllla, uluhal (Sinhala), uwatu (Sinhala)



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Fenugreek/Drug Interactions:

- **General:** Trigonelline, a constituent of fenugreek, was used as a quaternary carrier for improved drug delivery into the brain (192), into specific cells (193), or to the skin (194).
- **Acetylcholinesterase inhibitors:** Based on *in vitro* study, fenugreek extracts and trigonelline inhibited acetylcholinesterase activity (1), but conflicting data exist (195).
- **Albumin:** Based on animal study, albumin had additional hypolipemic effects over fenugreek alone (196).
- **Analgesics:** Based on rat study, *Trigonella foenum-graecum* extract may have analgesic activity similar to nonsteroidal anti-inflammatory drugs (NSAIDs) (2;121). Analgesic effects of fenugreek seed extract were shown in other studies, perhaps by decreasing inflammation (8;9;10). Based on animal study, acetaminophen resulted in depletion of trigonelline (197).
- **Antiarrhythmics:** Fenugreek aqueous extract was found to reduce potassium levels in human study and theoretically may increase the risk of hypokalemia when used with certain antiarrhythmic agents (83).
- **Anticoagulants and antiplatelets:** Based on animal study, case report, and theory, fenugreek preparations may raise prothrombin time (PT) or International Normalized Ratio (INR), decrease platelet aggregation, and increase the risk of bleeding (118;119;120;121;122). In rat study, a fenugreek extract inhibited ADP (10^{-5} M)-induced platelet aggregation ($IC_{50}=1.28$ mg/mL) (121).
- **Antidepressants, monoamine oxidase inhibitors (MAOIs):** Fenugreek has been theorized to possibly potentiate the activity of MAOIs, although reliable human data are lacking in this area.
- **Antidiabetic:** In human study, fenugreek seed powder resulted in the decreased use of oral hypoglycemic drug intake and a decline in percentage of the subjects who were on hypoglycemic drugs (88). Data from preclinical and human study suggest that fenugreek possesses both acute and chronic hypoglycemic properties (75;76;77;78;79;80;80;80;81;82;83;84;85;86;87;88;89;90;91;92;93;94;95), and the hypoglycemic effects of fenugreek extracts and oils and galactomannan have been shown in animal study (34;96;97;98;99;100;101;102;103;104;105;106;107;108;109;110;111;112;113;114;115;116). In human study, fenugreek saponins plus sulfonylureas were more effective than sulfonylureas alone for blood glucose lowering (117). In animal study, a combination of lower doses of fenugreek extract and glimepiride (5mg/kg of body weight) showed safer hypoglycemic activity over higher doses, which resulted in lethal hypoglycemia (112).
- **Antifungals:** Based on *in vitro* study, fenugreek extracts (seeds and other plant parts) and a cloned defensin Tfgd1 from fenugreek had antifungal activity (4).

smilagenin, sotolone, star fenugreek, syndrex, tricin, tricin-7-O-beta-D-glucopyranoside, trigonella, *Trigonella*, *Trigonella balansae*, *Trigonella caerulea*, *Trigonella foenum-graecum*, *Trigonella poenumgraecum* L., *Trigonella semen*, *Trigonella stellata*, trigonelline, trigoneoside Xa, trigoneoside Xb, trigoneoside Xlb, trigoneoside Xlla, trigoneoside Xllb, trigoneoside Xllla, uluhal (Sinhala), uwatu

Diabetes mellitus and related conditions

Levels of scientific evidence for specific therapies

Grade: A (Strong Scientific Evidence)	
Therapy	Specific therapeutic Use(s)
Alpha-lipoic acid	Type 2 diabetes
Konjac glucomannan	Diabetes
Grade: B (Good Scientific Evidence)	
Therapy	Specific therapeutic Use(s)
Beta-glucan	Diabetes
Chromium	Hypoglycemia
Fenugreek	Diabetes mellitus type 2
Guar gum	Diabetes mellitus
Gymnema	Type 1 diabetes mellitus
Gymnema	Type 2 diabetes mellitus
Ivy gourd	Diabetes
Magnesium	Diabetes (type 2)
Nicotinamide	Type 1 Diabetes mellitus: preservation of beta-islet cell function
Vanadium	Diabetes
Whey protein	Diabetes
Grade: C (Unclear or Conflicting Scientific Evidence)	
Therapy	Specific therapeutic Use(s)
Acidophilus	Diabetes (type 2)
Active hexose correlated compound	Diabetes
Acupuncture	Diabetes
Agar	Diabetes
Alfalfa	Diabetes
Aloe	Diabetes

LexiComp

Is the dosage for lisinopril correct?


- Up-to-date comprehensive drug information for clinicians
- Over 1600 drug monographs including drug interactions, tablet identification, medical calculations, patient education leaflets
- Delivers key information quickly
- **M**: Available on mobile devices

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Dosing: Adult

Heart failure: Oral: Initial: 2.5-5 mg once daily; then increase by no more than 10 mg increments at intervals no less than 2 weeks to a maximum daily dose of 40 mg. Usual maintenance: 5-40 mg/day as a single dose. Target dose: 20-40 mg once daily (ACC/AHA 2009 Heart Failure Guidelines)

Note: If patient has hyponatremia (serum sodium <130 mEq/L) or renal impairment (Cl_{Cr} <30 mL/minute or creatinine >3 mg/dL), then initial dose should be 2.5 mg/day

Hypertension: Oral: Usual dosage range (JNC 7): 10-40 mg/day

Not maintained on diuretic: Initial: 10 mg/day

Maintained on diuretic: Initial: 5 mg/day

Note: Antihypertensive effect may diminish toward the end of the dosing interval especially with doses of 10 mg/day. An increased dose may aid in extending the duration of antihypertensive effect. Doses up to 80 mg/day have been used, but do not appear to give greater effect.

Patients taking diuretics should have them discontinued 2-3 days prior to initiating lisinopril if possible. Restart diuretic after blood pressure is stable if needed. If diuretic cannot be discontinued prior to therapy, begin with 5 mg with close supervision until stable blood pressure. In patients with hyponatremia (<130 mEq/L), start dose at 2.5 mg/day.

Acute myocardial infarction (within 24 hours in hemodynamically stable patients): Oral: 5 mg immediately, then 5 mg at 24 hours, 10 mg at 48 hours, and 10 mg every day thereafter for 6 weeks. Patients should continue to receive standard treatments such as thrombolytics, aspirin, and beta-blockers.

Dosing: Geriatric Refer to adult dosing. In the management of hypertension, consider lower initial doses (eg, 2.5-5 mg/day) and titrate to response (Aronow, 2011).

Dosing: Pediatric

Hypertension: Children ≥6 years: Oral: Initial: 0.07 mg/kg once daily (up to 5 mg); increase dose at 1- to 2-week intervals; doses >0.61 mg/kg or >40 mg have not been evaluated.

Dosing: Renal Impairment

Heart failure: Adults: Cl_{Cr} <30 mL/minute or creatinine >3 mg/dL: Initial: 2.5 mg/day

Hypertension:

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Clinical Practice Guidelines

Coronary Artery Bypass Graft Surgery:

ACCF/AHA, "2011 ACCF/AHA Guideline for Coronary Artery Bypass Graft Surgery," [November 2011](#)

Diabetes Mellitus:

American Diabetes Association, "Standards of Medical Care in Diabetes - 2013," [January 2013](#)

Canadian Diabetes Association, "Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada," [2013](#)

Heart Failure:

ACCF/AHA, "2009 Focused Update Incorporated Into the ACC/AHA 2005 Guidelines for the Diagnosis and Management of Heart Failure in Adults," [March 2009](#)

ACCF/AHA, "2013 ACCF/AHA Guideline for the Management of Heart Failure," [June 2013](#). **Note:** Information contained within this monograph is pending revision based on these more recent guidelines.

Canadian Cardiovascular Society, "2012 Heart Failure Management Guidelines Update: Focus on Acute and Chronic Heart Failure," [2012](#)

"HFSA 2010 Comprehensive Heart Failure Practice Guideline," [July 2010](#)

Hypertension:

"ACCF/AHA Expert Consensus Document on Hypertension in the Elderly," [2011](#)

"National High Blood Pressure Education Program Working Group on High Blood Pressure in Children and Adolescents," [May 2005](#)

"The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: The JNC 7 Report," [August 2004](#)

Hypertension.

Standards of Medical Care in Diabetes—2013

AMERICAN DIABETES ASSOCIATION

Diabetes mellitus is a chronic illness that requires continuing medical care and ongoing patient self-management education and support to prevent acute complications and to reduce the risk of long-term complications. Diabetes care is complex and requires multifactorial risk reduction strategies beyond glycemic control. A large body of evidence exists that supports a range of interventions to improve diabetes outcomes.

These standards of care are intended to provide clinicians, patients, researchers, payers, and other interested individuals with the components of diabetes care, general treatment goals, and tools to evaluate the quality of care. Although individual preferences, comorbidities, and other patient factors may require modification of goals, targets that are desirable for most patients with diabetes are provided. Specifically titled sections of the standards address children with diabetes, pregnant women, and people with prediabetes. These standards are not intended to preclude clinical judgment or more extensive evaluation and management of the patient by other specialists as needed. For more detailed information about management of diabetes, refer to references (1–3).

The recommendations included are screening, diagnostic, and therapeutic actions that are known or believed to favorably affect health outcomes of patients with diabetes. A large number of these interventions have been shown to be cost-effective (4). A grading system (Table 1), developed by the American Diabetes Association (ADA) and modeled after existing methods, was utilized to clarify and codify the evidence that forms the basis for the recommendations. The level of evidence that supports each recommendation is listed after each recommendation using the letters A, B, C, or E.

These standards of care are revised annually by the ADA's multidisciplinary Professional Practice Committee, incorporating new evidence. For the current revision, committee members systematically searched Medline for human studies related to each subsection and published since 1 January 2011. Recommendations (bulleted at the beginning of each subsection and also listed in the "Executive Summary: Standards of Medical Care in Diabetes—2013") were revised based on new evidence or, in some cases, to clarify the prior recommendation or match the strength of the wording to the strength of the evidence. A table linking the changes in recommendations to new evidence can be reviewed at <http://professional.diabetes.org/CPR>. As is the case for all position statements, these standards of care were reviewed and approved by the Executive Committee of ADA's Board of Directors, which includes health care professionals, scientists, and lay people.

Feedback from the larger clinical community was valuable for the 2013 revision of the standards. Readers who wish to comment on the "Standards of Medical Care in Diabetes—2013" are invited to do so at <http://professional.diabetes.org/CPR>.

Members of the Professional Practice Committee disclose all potential financial conflicts of interest with industry. These disclosures were discussed at the onset of the standards revision meeting. Members of the committee, their employer, and their disclosed conflicts of interest are listed in the "Professional Practice Committee for the 2013 Clinical Practice Recommendations" table (see p. S109). The ADA funds development of the standards and all its position statements out of its general revenues and

does not use industry support for these purposes.

I. CLASSIFICATION AND DIAGNOSIS

A. Classification

The classification of diabetes includes four clinical classes:

- Type 1 diabetes (results from β -cell destruction, usually leading to absolute insulin deficiency)
- Type 2 diabetes (results from a progressive insulin secretory defect on the background of insulin resistance)
- Other specific types of diabetes due to other causes, e.g., genetic defects in β -cell function, genetic defects in insulin action, diseases of the exocrine pancreas (such as cystic fibrosis), and drug- or chemical-induced (such as in the treatment of HIV/AIDS or after organ transplantation)
- Gestational diabetes mellitus (GDM) (diabetes diagnosed during pregnancy that is not clearly overt diabetes)

Some patients cannot be clearly classified as type 1 or type 2 diabetic. Clinical presentation and disease progression vary considerably in both types of diabetes. Occasionally, patients who otherwise have type 2 diabetes may present with ketoacidosis. Similarly, patients with type 1 diabetes may have a late onset and slow (but relentless) progression of disease despite having features of autoimmune disease. Such difficulties in diagnosis may occur in children, adolescents, and adults. The true diagnosis may become more obvious over time.

B. Diagnosis of diabetes

For decades, the diagnosis of diabetes was based on plasma glucose criteria, either the fasting plasma glucose (FPG) or the 2-h value in the 75-g oral glucose tolerance test (OGTT) (5).

In 2009, an International Expert

Davis's Drug Guide for Nurses 2012

[Nursing Implications](#)



Lisinopril

Assessment

- **Hypertension:** Monitor BP and pulse frequently during initial dosage adjustment and periodically during therapy. Notify health care professional of significant changes.
- Monitor frequency of prescription refills to determine compliance.
- **Assess patient for signs of angioedema (dyspnea, facial swelling).**
- **Heart Failure:** Monitor weight and assess patient routinely for resolution of fluid overload (peripheral edema, rales/crackles, dyspnea, weight gain, jugular venous distention).
- **Lab Test Considerations:** Monitor renal function. May cause increase in BUN and serum creatinine.
- May cause hyperkalemia.
- Monitor CBC periodically during therapy in patients with collagen vascular disease and/or renal disease. May rarely cause slight decrease in hemoglobin and hematocrit and agranulocytosis.
- May cause elevated AST, ALT, alkaline phosphatase, and serum bilirubin.

Potential Nursing Diagnoses

Decreased cardiac output (Indications) (Side Effects)
Noncompliance (Patient/Family Teaching)

Implementation

- **Do not confuse Zestril with Zegerid, Zetia, or Zyprexa.**
- Correct volume depletion, if possible, before initiation of therapy. Precipitous drop in BP during first 1–3 hr following first dose may require volume expansion with normal saline. Discontinuing diuretic therapy or cautiously increasing salt intake 2–3 days prior to initiation may decrease risk. Monitor closely for at least 1 hr after BP has stabilized. Resume diuretics if BP is not controlled.
- **Oral:** For patients with difficulty swallowing tablets, pharmacist can compound an oral suspension; stable at room temperature for 4 wk. Shake suspension before each use.

Patient/Family Teaching

- Instruct patient to take medication as directed at the same time each day, even if feeling well. Take missed doses as soon as remembered but not if almost time for next dose. Do not double doses. Warn patient not to discontinue ACE inhibitor therapy unless directed by health care professional.
- Caution patient to avoid salt substitutes containing potassium or foods containing high levels of potassium or sodium unless directed by health care professional. See [Appendix \(Food Sources For Specific Nutrients\)](#).
- Caution patient to change positions slowly to minimize orthostatic hypotension. Use of alcohol, standing for long periods, exercising, and hot weather may increase orthostatic hypotension.
- Advise patient to consult health care professional before taking any OTC cough, cold, or allergy remedies, or other medications or herbal products.
- May cause dizziness. Caution patient to avoid driving and other activities requiring alertness until response to medication is known.
- Advise patient to inform health care professional of medication regimen before treatment or surgery.
- **Instruct patient to notify health care professional if rash; mouth sores; sore throat; fever; swelling of hands or feet; irregular heart beat; chest pain; dry cough; hoarseness; swelling of face, eyes, lips, or tongue; or if difficulty swallowing or breathing occurs.** Persistent dry cough may occur and may not subside until

VisualDx

And what is that rash on her arms?

- Web-based clinical decision support system
- Enhances diagnostic accuracy and aids in therapeutic decision-making
- Provides access to concise disease information and quality medical images to:
 - assist in diagnosis
 - guide management and therapy decisions
- Includes Differential Builder
- **M**: Available on mobile devices

Differential Builder

Build a differential by entering patient findings.



Search by **Dx** diagnosis, **Rx** medication, or **F** patient finding.

Choose a Clinical Scenario

Pediatric Skin

Neonate/Infant < 1 year

- ▶ Multiple Lesions or Rash
- ▶ Single Lesion or Growth

Child < 18 years

- ▶ Multiple Lesions or Rash
- ▶ Single Lesion or Growth

Specialized Content

- ▶ Male Anogenital
- ▶ Female Anogenital

Adult Skin

Adult > 18 years

- ▶ Multiple Lesions or Rash 
- ▶ Single Lesion or Growth
- ▶ Dark Skin - Multiple Lesions or Rash
- ▶ Dark Skin - Single Lesion or Growth

Elder > 70 years

- ▶ Multiple Lesions or Rash
- ▶ Single Lesion or Growth

Specific Clinical Scenarios

- ▶ Fever & Rash
- ▶ Immunocompromised
- ▶ International Travel
- ▶ Bites, Stings, & Infestations
- ▶ Marine Exposures
- ▶ Male Anogenital
- ▶ Female Anogenital
- ▶ Nail & Distal Digit
- ▶ Hair & Scalp
- ▶ Cellulitis DDX

Add Body Location / Distribution



- Scalp
- Face
- Neck
- Arm
- Shoulder
- Axilla
- Antecubital Fossa
- Elbow
- Forearm
- Upper Arm
- Wrist
- Hand or Fingers
- Trunk
- Anogenital
- Leg
- Foot (Feet) or Toes

Distributions:

- Widespread
- Scattered Haphazard
- Scattered Few
- Acral
- Photodistributed (Sun-Exposed)
- Intertriginous
- Symmetric Extremities
- Lymphangitic

Male Female

Add Key Findings



Appearance

- No Acute Distress
- Patient Appears Ill
- Patient Appears Systemically Ill - Toxic
- None

Timing

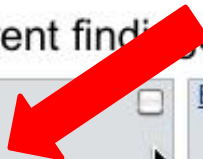
- Developed Rapidly in Minutes or Hours
- Developed Acutely Over Days to Weeks
- Developed Steadily Over Weeks to Months
- Developed Chronically Lasting Months to Years
- Recurring Episodes or Relapses
- None

Other Findings

- Fever (Febrile)
- Pruritus (Itching)
- Arthralgia (Joint Pain)
- Lymphadenopathy

OK Cancel

86 diagnoses match all 2 current findings



[Abscess](#)



[All Images \(15\)](#)

[Bedbug Bite](#)



[All Images \(25\)](#)

[Bite or Sting, Arthropod](#)



[All Images \(29\)](#)

[Cellulitis](#)



[All Images \(24\)](#)

[Dermatitis, Allergic Contact](#)



[All Images \(82\)](#)

[Dermatitis, Dyshidrotic](#)



[All Images \(21\)](#)

[Dermatitis, Perioral](#)



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[Dermatitis, Poison Ivy - Oak - Sumac](#)



[All Images \(32\)](#)

[Dermatitis, Stasis](#)



[All Images \(25\)](#)

[Ecthyma Gangrenosum](#)



[All Images \(17\)](#)

[Erysipelas](#)



[All Images \(21\)](#)

[Folliculitis](#)



[All Images \(20\)](#)

[Furunculosis](#)



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[Herpes Simplex Virus](#)



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[Herpes Simplex Virus, Genital](#)



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Bedbug Bites



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Clinical Scenario

- Adult Rash**
- [Dark Skin Rash](#)
 - [Child Rash](#)
 - [International Travel](#)
 - [Bites, Stings and Infestations](#)

Differential Diagnosis & Pitfalls

- [Drug eruption](#)
- [Allergic contact dermatitis](#)
- [Atopic dermatitis](#)
- [Gianotti-Crosti syndrome](#) (in children)
- [Pityriasis lichenoides et varioliformis acuta](#)
- [Ecthyma](#)
- [Dermatitis herpetiformis](#)
- [Scabies](#) (look for burrows)
- [Pediculosis corporis](#) (examine hairs for lice and nits)
- [Flea bites](#) (ask about pets)
- [Urticaria](#)
- [Papular urticaria](#)

Best Tests

This is largely a clinical diagnosis based on careful history and physical examination and assessment of the sleeping and living environment. Punch biopsy may indicate an arthropod reaction.

Management

The infestation of rooms should be eliminated and mattress and box springs treated with insecticide (malathion) which has resulted in illness, irritation and death.

If these measures are not effective, the patient should be referred to a pest control professional.

Therapy

Eradicate the infestation. Therefore, treatment is aimed at controlling symptoms.

Oral antihistamines for pruritus: diphenhydramine 25-50 mg p.o. 3 times daily or hydroxyzine 10-25 mg p.o. 3 times daily, as tolerated.

Mid-potency topical corticosteroids (Class 3-4) for skin lesions:

- Triamcinolone cream, ointment – Apply twice daily (15, 30, 60, 120, 240 gm).
- Mometasone cream, ointment – Apply twice daily (15, 45 gm).
- Fluocinonide cream, ointment – Apply twice daily (15, 30, 60 gm).

Use Class 6-7 steroids on the face (desonide cream, lotion, or ointment twice daily).

Secondary infection may require oral antibiotic therapy.

Bullous reactions may be treated with short courses of oral corticosteroids: 0.5 mg/kg each morning for 14 days, tapering slowly during the interval.

VisualDx



Therapy

Eradicate the infestation as described. Bites will resolve on their own in 1-2 weeks. Therefore, treatment is aimed at controlling symptoms.

Oral antihistamines for pruritus: diphenhydramine 25-50 mg p.o. 3 times daily or hydroxyzine 10-25 mg p.o. 3 times daily, as tolerated.

Mid-potency topical corticosteroids (Class 3-4) for skin lesions:

- Triamcinolone cream, ointment – Apply twice daily (15, 30, 60, 120, 240 gm).
- Mometasone cream, ointment – Apply twice daily (15, 45 gm).
- Fluocinonide cream, ointment – Apply twice daily (15, 30, 60 gm).

Use Class 6-7 steroids on the face (desonide cream, lotion, or ointment twice daily).

Secondary infection may require oral antibiotic therapy.

Bullous reactions may be treated with short courses of oral corticosteroids: 0.5 mg/kg each morning for 14 days, tapering slowly during the interval.

Medline Plus

Where can I find information for Mrs. Hernandez in Spanish?

- **#1** for basic quality consumer/patient information
- Includes 900 health topics
- Drug and herbal information
- Medical Encyclopedia – full-text with illustrations
- **Spanish version**
- Interactive tutorials
- Current health news
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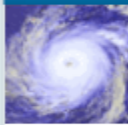
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Clinical Trials

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MAGAZINE

EASY TO READ

MULTIPLE LANGUAGES

Diabetes tipo 2 [Spanish]

Otros nombres: Diabetes de aparición en adultos insulino dependiente

Diabetes Type 2

Also called: Type 2 Diabetes

MedlinePlus



MEDICAL ENCYCLOPEDIA

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[Diabetes Mellitus](#)

[Endocrine System](#)

National Institutes of Health

The primary NIH organization for research on *Diabetes Type 2* is the [National Institute of Diabetes and Digestive and Kidney Diseases](#)

Languages

La [diabetes](#) significa que la glucosa en la sangre, está muy alta. Con la diabetes tipo 2, el organismo no produce o usa bien la insulina. La insulina es la hormona que ayuda a la glucosa a entrar a las células para darles energía. Sin insulina hay demasiada glucosa en la sangre por lo que se desarrolla [problemas serios](#) para el corazón, los nervios, las encías y los dientes.

Usted tiene un riesgo alto de tener diabetes tipo 2 si es obeso, tiene historia familiar de diabetes o no se ejercita.

Los síntomas de la diabetes tipo 2 aparecen lentamente y algunas personas ni siquiera los notan. Pueden incluir:

- Sed
- Orinar frecuentemente
- Sentirse hambriento o cansado
- Perder peso sin proponérselo
- Tener heridas que sanan lentamente
- Visión borrosa

Un examen de sangre puede mostrar si usted tiene diabetes. Algunas personas controlan su diabetes a través de una dieta saludable, actividad física y exámenes de glucosa en la sangre. Otras necesitan además tomar algunas [medicinas para la diabetes](#).

NIH: Instituto Nacional de la Diabetes y las Enfermedades Renales

Reciba actualizaciones sobre Diabetes tipo 2 por email

Comience aquí

- [Diabetes tipo 2](#) - Enciclopedia
- También está disponible en [inglés](#)

[Diabetes](#) means your blood glucose, or [blood sugar](#), levels are too high. With type 2 diabetes, the more common type, your body does not make or use insulin well. Insulin is a hormone that helps glucose get into your cells to give them energy. Without insulin, too much glucose stays in your blood. Over time, high blood glucose can lead to [serious problems](#) with your [heart](#), [eyes](#), [kidneys](#), [nerves](#), and gums and teeth.

You have a higher risk of type 2 diabetes if you are older, obese, have a family history of diabetes, or do not exercise.

The symptoms of type 2 diabetes appear slowly. Some people do not notice symptoms at all. The symptoms can include:

- Being very thirsty
- Urinating often
- Feeling very hungry or tired
- Losing weight without trying
- Having sores that heal slowly
- Having blurry eyesight

A blood test can show if you have diabetes. Many people can manage their diabetes through [healthy eating](#), physical activity, and blood glucose testing. Some people also need to take [diabetes medicines](#).

NIH: National Institute of Diabetes and Digestive and Kidney Diseases

Get Diabetes Type 2 updates by email

[GO](#) [What's this?](#)

Start Here

- [Am I at Risk for Type 2 Diabetes?](#) [NIH](#) (National Institute of Diabetes and Digestive and Kidney Diseases) Also available in [Spanish](#)
- [Facts about Type 2](#) [PDF](#) (American Diabetes Association)
- [Type 2 Diabetes: What You Need to Know](#) [NIH](#) (National Institute of Diabetes and Digestive and Kidney Diseases) - In English and Spanish

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Overviews

- [Diabetes Mellitus Type 2: Overview \(Beyond the Basics\)](#) (UpToDate)
- [Type 2 Diabetes](#) (Mayo Foundation for Medical Education and Research)
- [Type 2 Diabetes Mellitus](#) (InteliHealth, Harvard Medical School)
- [Your Guide to Diabetes: Type 1 and Type 2](#) *Easy-to-Read NIH* (National Institute of Diabetes and Digestive and Kidney Diseases)
Also available in [Spanish](#)

Latest News

- [More Evidence Weight-Loss Surgery Helps People with Diabetes](#) (03/31/2014, HealthDay)
- [Food Price Hikes May Affect Those with Type 2 Diabetes](#) (02/14/2014, HealthDay)
- [Food Prices and Diabetes](#) (02/14/2014, HealthDay)
- [Obesity's Link to Type 2 Diabetes Not So Clear-Cut](#) (02/12/2014, HealthDay)
- [NIH, Industry and Non-Profits Join Forces to Speed Validation of Disease Targets](#) *NIH* (02/04/2014, National Institutes of Health)
- [More News on Diabetes Type 2](#)

Diagnosis/Symptoms

- [A1C Test and Diabetes](#) *NIH* (National Institute of Diabetes and Digestive and Kidney Diseases)
- [Comparing Tests for Diabetes and Prediabetes: A Quick Reference Guide](#) *NIH* (National Institute of Diabetes and Digestive and Kidney Diseases)
- [Diabetes Numbers at-a-Glance 2012](#) *NIH* (National Diabetes Education Program) – PDF
- [Diagnosis of Diabetes and Prediabetes](#) *NIH* (National Institute of Diabetes and Digestive and Kidney Diseases)
- [Microalbumin Test](#) (Mayo Foundation for Medical Education and Research)
- [Symptoms](#) (American Diabetes Association)

Treatment

- [Diabetes Mellitus Type 2: Treatment \(Beyond the Basics\)](#) (UpToDate)
- [Medicines for Type 2 Diabetes: A Review of the Research for Adults](#) (Agency for Healthcare Research and Quality)
Also available in [Spanish](#)
- [MedlinePlus: Diabetes Medicines](#) *NIH* (National Library of Medicine)
Also available in [Spanish](#)
- [Premixed Insulin for Type 2 Diabetes: A Guide for Adults](#) (Agency for Healthcare Research and Quality)
Also available in [Spanish](#)
- [Women and Diabetes -- Diabetes Medicines](#) (Food and Drug Administration)
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Prevention/Screening

- [Choose More than 50 Ways to Prevent Type 2 Diabetes](#) *Easy-to-Read NIH* (National Diabetes Education Program) – PDF
- [Family Health History and Diabetes](#) *NIH* (National Diabetes Education Program)



Si tiene [diabetes](#), su cuerpo no puede producir o utilizar la insulina adecuadamente. Esto conduce a una elevación del nivel de glucosa (azúcar) en la sangre. Una alimentación sana ayuda a mantener el azúcar de la sangre en un nivel adecuado. Es una parte fundamental del manejo de la diabetes, ya que controlando el azúcar en la sangre (glucemia) se pueden prevenir las [complicaciones de la diabetes](#).

Un nutricionista puede ayudarlo a diseñar un plan de comidas específico para usted. Este plan debe tener en cuenta su peso, medicinas que esté tomando, estilo de vida y otros problemas de salud que usted pueda tener.

Una alimentación saludable para un diabético incluye

- Limitar alimentos con altos contenidos de azúcar
- Comer porciones pequeñas a lo largo del día
- Prestar atención a cuándo y cuánta cantidad de carbohidratos consume
- Consumir una gran variedad de alimentos integrales, frutas y vegetales
- Comer menos grasas
- Limitar el consumo del alcohol
- Usar menos sal

NIH: Instituto Nacional de la Diabetes y las Enfermedades Digestivas y Renales

Reciba actualizaciones
sobre Dieta para
diabéticos por email

[¿Qué es esto?](#)

Comience aquí

- [Diabetes y nutrición](#) (Academia Americana de Médicos de Familia)
También está disponible en [inglés](#)
- [Diabetes y plan de nutrición](#) *Tutorial interactivo* (Instituto de Educación al Paciente)
También está disponible en [inglés](#)



Temas relacionados

[Diabetes](#)

[Diabetes tipo 1](#)

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[Diabetes mellitus](#)

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Institutos Nacionales de la Salud

El organismo de los NIH principalmente responsable por realizar investigaciones científicas sobre *Dieta para diabéticos* es el [Instituto Nacional de la Diabetes y las Enfermedades Digestivas y Renales](#)

Cross-Cultural Healthcare Resources

- **EthnoMed** ethnomed.org
Cultural and medical issues pertinent to healthcare of ethnic groups in Seattle area
- **Culture Clues** depts.washington.edu/pfes/CultureClues.htm
Tip sheets for increasing awareness about preferences from diverse cultures
- **SPIRAL** spiral.tufts.edu
Patient information resources in Asian languages
- **Health Information in Multiple Languages**
www.nlm.nih.gov/medlineplus/languages/languages.html
- **RHIN** rhin.org For refugees and health providers
- **Consumer Health Information in Many Languages**
nmlm.gov/outreach/consumer/multi.html

EthnoMed *ethnomed.org*

- Information about cultural beliefs and medical issues pertinent to the health care of immigrants to Seattle
- SE Asian and East African populations originally
 - *Cambodian, Ethiopian, Oromo, Somali, Tigrean and Vietnamese.*
 - Other ethnic groups added, such as Chinese, Hmong, Hispanic, Iraqi, and more.
- Includes patient information pamphlets in various languages


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FEATURE: OCTOBER/NOVEMBER 2013

MULTIMEDIA PATIENT EDUCATION HIGHLIGHT: CANCER

EthnoMed and Healthy Roads Media, in collaboration with the Community House Calls Program at Harborview and its community partners, produced a series of handouts and Flash video slideshows in seven languages (**Amharic, English, Khmer, Somali, Spanish, Tigrinya and Vietnamese**) that provide introductory information about several topics: biopsy procedures, cancer chemotherapy, prostate cancer and surgeries for breast cancer.

[Biopsy](#) | [Cancer Chemotherapy](#) | [Prostate Cancer](#) | [Surgeries for Breast Cancer](#)

Cancer education was identified by the Community House Calls staff as a major area of need for EthnoMed content development. The program's Caseworker / Cultural Mediators (CCMs) served as advisors and narrators, community members provided linguistic/cultural input, and health care providers gave clinical input to develop the new education materials. The project also supports CCMs in utilizing iPads for delivering health education to patients and community groups.



The new materials are available for web viewing via both the [EthnoMed](#) and [Healthy Roads Media](#) websites. [Healthy Roads Media](#) is also hosting mobile video

Welcome To EthnoMed

EthnoMed contains information about cultural beliefs, medical issues and related topics pertinent to the health care of immigrants to Seattle or the US, many of whom are refugees fleeing war-torn parts of the world.

EthnoMed Newsletter

Subscribe to our e-Newsletter to receive updates about what's new. [Read more...](#)

Local Somali Leader Honored As Champion Of Change

Mohamed Ali, a Somali refugee with a master's degree in public health, has been recognized by the White House as a **Champion of**

Author(s): Andrea B. Smith, MD PhD, Author

Reviewer(s): Community Reader, Rozy Ramirez Harborview Medical Center/University of Washington

Contributor(s): Leon Reines, Revisions, August 2003

Date Authored: September 01, 2000

Date Last Reviewed: August 01, 2003

MEXICO

Geography

Mexico is bordered to the North by Texas, New Mexico, Arizona and California. To the South it is bordered by Guatemala and Belize. To the East is the Caribbean Sea and the Gulf of Mexico. To the West is the Pacific Ocean. The total area of Mexico is 1,972,550 sq. km which is slightly less than three times the size of Texas. The climate varies from tropical to desert and the terrain includes high rugged mountains, deserts, low coastal plains and high plateaus. Mexico is made up of 31 states and has Mexico city as its capital.

History and Politics

Originally inhabited by many different ethnic groups from which you can mention the Mayas, Zapotec, Aztec and others, Mexico, like much of South and Central America, was colonized by the Spanish, being occupied from 1521-1810. Colonization led to both the acquisition of Spanish culture and the loss of great part of the Aztec culture, with the present day culture being a melange of the two. Mexican independence occurred September 16, 1810 and was sparked by the Napoleonic threat to acquire what was then "New Spain". Afraid of losing their emerging culture, the "criollos" (descendants of the Spaniards born in Mexico) and the "mestizos" (descendants of the Spanish and Indian intermarriages) united in a movement known as "Los Insurgentes" which eventually overthrew Spain.

Texas at that time was sparsely inhabited, having been neglected by Spain in the years prior to the revolution. The newly formed Mexican government therefore allowed US citizens to settle there. These citizens did not adopt the Mexican language or culture and in 1829 when Mexico

Contents

- [Mexico](#)
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 - [Greetings and Displays of Respect](#)
 - [Etiquette](#)
 - [Family Life and Kinship Structure](#)
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 - [Traditional diseases](#)
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 - [Experience with Western Medicine in Home Country](#)
 - [Experience with Western Medicine in the United States](#)
- [References](#)

MEXICAN CULTURAL PROFILE

Author(s): Andrea B. Smith, MD PhD, Author

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Etiquette

Studies indicate that Hispanics expect a caregiver to show warmth to a patient and family members and should not be strictly business (Zouchay). A physician should be attentive, take their time, show respect, and if possible communicate in Spanish. Some simple phrases are listed above for those who do not know any Spanish. Hispanics also have more respect for care givers if they exhibit confidence.

Family Life and Kinship Structure

Although Mexican families tend to be Patriarchal, it is the mother who is in charge of health care (Gonzalez-Swafford). Home remedies are passed on from mother to daughter. When a family member is sick, it is a family crisis and often there will be many people to whom the in charge of health care, for more difficult and chronic treatments, it is often important to physician will have to explain the disease process (Davidhizar). Although the mother is the one convince the father that this is necessary.

Adulthood and Old Age

For information on geriatrics and older Hispanic/Latino Americans, see Stanford's Ethno Med [Health and Health Care of Hispanic/Latino American Older Adults](#). This is an on-line learning module, but you can download the module as a PDF and print the cultural profile by filling out a short survey. Additional cultures and geriatric information also available on their site.

Nutrition and Food

Food is often used to cure illness as will be discussed later (Gonzalez-Swafford). Here we list some foods as they are categorized for healing.

Cold Foods	Hot Foods
Beans	Aromatic Beverages
Corn products	Chili
Dairy products	Expensive Meats (beef, water fowl, fish, mutton)


References



	Title	Format	Language(s)
1.	Diabetes Handout	Document	English; Arabic; Bosnian; Chinese; Farsi; French; German; Greek; Gujarati; Haitian Creole (Kreyol); Hebrew; Hindi; Hmong; Igbo; Japanese; Khmer; Korean; Kurdish; Polish; Portuguese; Romanian; Russian; Somali; Spanish; Swahili; Thai; Turkish; Urdu; Vietnamese; Yoruba
2.	Diabetes and Your Feet	Document	English; Haitian Creole (Kreyol); Portuguese; Spanish
3.	If You Have Diabetes, a Flu Shot Could Save Your Life	Document	English; Portuguese; Spanish
4.	Diabetes Info Sheet	Document	English; Chinese; Haitian Creole (Kreyol); Spanish; Vietnamese
5.	Diabetes: Are You at Risk?	Document	English; Haitian Creole (Kreyol); Khmer; Mandarin; Portuguese; Spanish; Vietnamese
6.	Are you at risk for the worlds fastest growing disease?	Audio; Document; Video	English; Arabic; Bosnian; Russian; Somali; Spanish
7.	Control Your Diabetes, It's Worth Your Time (Diet and Exercise)	Document; Video	English; Amharic; Bosnian; Somali; Spanish
8.	Control Your Diabetes, It's Worth Your Time - (The Basics)	Audio; Document; Video	English; Amharic; Bosnian; Karen; Somali; Spanish
9.	Control Your Diabetes: It's worth your time (Medication & Glucose)	Audio; Document; Video	English; Amharic; Bosnian; Karen; Somali; Spanish
10.	Control Your Diabetes: It's worth your time Pt.2, Diet and Exercise	Audio	English; Amharic; Bosnian; Somali; Spanish

Culture Clues

depts.washington.edu/pfes/CultureClues.htm



PATIENT AND FAMILY EDUCATION SERVICES

Our Purpose: To inform patients about their health and empower their decision-making about their health care.

A DEPARTMENT OF UNIVERSITY OF WASHINGTON MEDICAL CENTER • SEATTLE, WASHINGTON

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Culture Clues™

Culture Clues™ are tip sheets for clinicians, designed to increase awareness about concepts and preferences of patients from the diverse cultures served by University of Washington Medical Center.

Culture Clues™ are available for these cultures:

- [Albanian](#)
- [Chinese](#)
- [Deaf](#)
- [Hard of Hearing](#)
- [Korean](#)
- [Latino](#) ←
- [Russian](#)
- [Somali](#)
- [Vietnamese](#)

End-of-Life Culture Clues™

Also available are tip sheets regarding end-of-life care as often preferred by various cultures. The End-of-Life *Culture Clues™* are available for:

- [The Latino Culture](#)
- [The Russian Culture](#)
- [The Vietnamese Culture](#)



Communicating with Your Latino Patient

Perception of Illness • Patterns of Kinship and Decision Making • Comfort with Touch

Culture Clues™ is designed to increase awareness about concepts and preferences of patients from the diverse cultures served by University of Washington Medical Center. **Every person is unique; always consider the individual's beliefs, needs, and concerns.** Use Culture Clues™ and information from the patient and family to guide your communication and your patient care.

How does the Latino culture deal with illness?

Explaining the Causes of Illness and Disease

- Your patient may see illness as an imbalance. The imbalance may be between internal and external sources (for example, hot and cold, natural vs. supernatural, the soul is separate from the body).
 - **Ask your patient, "Can you tell me what caused your illness?"**
- There are folk-defined diseases such as *empacho* (stomach ailment) and standard western medically defined diseases such as measles, asthma, and TB.
- Many patients seek medical care from *curanderos* or other folk healers.
 - **Ask about use of pharmaceuticals or home therapies such as herbal remedies or certain foods. Screen for possible patient use of injectables, especially antibiotics or vitamins. Ask if you can see the home treatment if your patient cannot identify the substance.**

Helping Your Patient Take an Active Role in Care and Recovery

- Your patient may believe that God determines the outcome of illness.
 - **Consider the impact religion will have in your patient's active participation in health care recovery. You can validate your patient's belief by asking, "Will God be served by taking the best care of yourself?"**
- The patient is seen as an innocent victim, and will be expected to be passive when ill.
 - **Help your patient take an active role in his or her recovery.**

Helping Your Patient Feel Comfortable with UWMC

- Remember to find out if this is your patient's first visit to University of Washington Medical Center.
 - **Keep in mind that patients who are new to the system may not be aware of the role of the Primary Care Team or the process for getting a referral to a specialist.**

Understanding Concerns About Depression

- Depression may not be seen as an illness. It is often seen as a weakness and an embarrassment to family.
 - **Treat these issues with respect. You may want to also offer the services of a clergy member.**

How are medical decisions made in the Latino culture?

Making Decisions About Health Care

- The mother determines when a family member requires medical care; the male head of the household gives permission to go to the medical center.
- Head of household, often oldest adult male, is the decision-maker, but important decisions often involve the whole family. The family spokesperson is usually the father or oldest male.
 - **Ask your patient about whom they want to be included in medical decisions. If the patient does not want to make medical decisions for themselves, let them know they need to prepare a Durable Power of Attorney for health care.**
 - **When possible, engage the whole family in discussions that involve decisions about care.**

Managing Medical News

- The family would prefer to hear about bad medical news before the patient is informed. The family spokesperson usually delivers information about the severity of illness. The family may want to shield the patient from the bad news.

And when you have more time... search for Research articles

- PubMed Clinical Queries
 - Special section of PubMed that quickly connect clinicians with evidence-based clinical literature
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 - coverage from 1982+ of nursing and 17 allied health disciplines literature
 - 1700+ journals indexed
 - Can easily search for Research articles
 - **M**: Available on mobile devices





PubMed Clinical Queries

The screenshot shows the PubMed website interface. At the top left is the Med.gov logo and the text "National Library of Medicine National Institutes of Health". To the right is a search bar with "PubMed" selected in a dropdown menu and a search button. Below the search bar is the word "Advanced".

The main content area features a large dark blue box with the text: "PubMed comprises more than 23 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher web sites." To the right of this box is a "PubReader" section with the text "A whole new way to read scientific literature at PubMed Central" and an image of a tablet displaying a scientific article.

Below the main content area are three columns of navigation links:

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PubMed Clinical Queries

Results of searches on this page are limited to specific clinical research areas. For comprehensive searches, use

diabetes AND fenugreek

Clinical Study Categories

Category:

Scope:

Results: 5 of 6

Antidiabetic plants of Iran.

Shojaii A, Dabaghian FH, Goushegir A, Fard MA.
Acta Med Iran. 2011; 49(10):637-42.

Meta-analysis of the effect of herbal supplement on glycemic control in type 2 diabetes.

Suksomboon N, Poolsup N, Boonkaew S, Suthisisang CC.
J Ethnopharmacol. 2011 Oct 11; 137(3):1328-33. Epub 2011 Aug 5.

Fenugreek bread: a treatment for diabetes mellitus.

Losso JN, Holliday DL, Finley JW, Martin RJ, Rood JC, Yu Y, Greenway FL.
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Systematic Reviews

Results: 5 of 6

Antidiabetic plants of Iran.

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Krishnaswamy K.
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[See all \(6\)](#)

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J Ethnopharmacol. 2011 Oct 11;137(3):1328-33. doi: 10.1016/j.jep.2011.07.059. Epub 2011 Aug 5.

Meta-analysis of the effect of herbal supplement on glycemic control in type 2 diabetes.

[Suksomboon N](#), [Poolsup N](#), [Boonkaew S](#), [Suthisisang CC](#).
Department of Pharmacy, Faculty of Pharmacy, Mahidol University, Bangkok 10400, Thailand.

Abstract

ETHNOPHARMACOLOGICAL RELEVANCE: A variety of herbs has been used in traditional medicine for the treatment of type 2 diabetes. However, evidence is limited regarding the efficacy of individual herbs for glycemic control. We performed a systematic review and meta-analysis to evaluate the effect of herbal supplement on glycemic control in type 2 diabetes.

MATERIALS AND METHODS: Randomized controlled trials were identified through electronic searches (MEDLINE, EMBASE and Cochrane Central Register of Controlled Trials) up until February 2011, historical searches of relevant articles and personal contact with experts in the area. Studies were included in the meta-analysis if they were (1) randomized placebo-controlled trial of single herb aimed at assessing glycemic control in type 2 diabetes, (2) of at least 8 weeks duration, and (3) reporting HbA(1c). Treatment effect was estimated with mean difference in the final value of HbA(1c) and FBG between the treatment and the placebo groups.

RESULTS: Nine randomized, placebo-controlled trials (n = 487 patients) were identified. Ipomoea batatas, Silybum marianum and Trigonella foenum-graecum significantly improved glycemic control, whereas Cinnamomum cassia did not. The pooled mean differences in HbA(1c) were -0.30% (95% CI -0.04% to -0.57%; P = 0.02), -1.92% (95% CI -0.51% to -3.32%; P = 0.008), and -1.13% (95% CI -0.11% to -2.14%; P = 0.03), respectively, for Ipomoea batatas, Silybum marianum, and Trigonella foenum-graecum. The corresponding values for FBG were -10.20mg/dL (95% CI -5.32 mg/dL to -15.08 mg/dL; P<0.0001) and -38.05 mg/dL (95% CI -9.54 mg/dL to -66.57 mg/dL; P = 0.009), respectively, for Ipomoea batatas and Silybum marianum.

CONCLUSIONS: The current evidence suggests that supplementation with Ipomoea batatas, Silybum marianum, and Trigonella foenum-graecum may improve glycemic control in type 2 diabetes. Such effect was not observed with Cinnamomum cassia. Given the limitations of the available studies and high heterogeneity of the study results for milk thistle and fenugreek, further high quality, large controlled trials using standardized preparation are warranted to better elucidate the effects of these herbs on glycemic control in type 2 diabetes patients.

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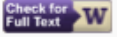


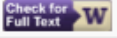


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- Other states: contact your State Library or association
- Public libraries: have health-related databases
- Many free journal sites:
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 - PubMed Central *pubmedcentral.gov*
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[Set up your HEAL-WA access](#) - to set up a HEAL-WA access code and password, see the instructions on the [Getting Started](#) page.

E-Resources for Non-OHSU Oregon Licensed Health Professionals

- <http://www.ohsu.edu/xd/education/library/orhp.cfm>
- Access Medicine
 - includes 75 medical reference books
 - includes the Lange *Current Diagnosis and Treatment* series, *Harrison's*, etc.
 - offers downloads for mobile devices

Key Points

- Refer to the handout:
“E-Resources for Ambulatory Care”
- Remember ambulatory care E-resources shown:
 - Nursing Reference Center
 - DynaMed
 - Natural Standard
 - LexiComp
 - VisualDx
 - MedlinePlus
 - EthnoMed



E-Resources for Ambulatory Care

Handout:

<http://media.hsl.washington.edu/media/schnall/AmbCare2014handout.pdf>

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Questions?

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