

ADAPTING YOUR PRACTICE

*Treatment and Recommendations
for Homeless Patients with Hypertension,
Hyperlipidemia & Heart Failure*

Cardiovascular Diseases



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for Homeless Patients with Hypertension,
Hyperlipidemia & Heart Failure*

Health Care for the Homeless
Clinicians' Network
2009 *Second Edition*

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DISCLAIMER

The information and opinions expressed in this document are those of the Advisory Committee on Adapting Clinical Guidelines for Homeless Patients with Cardiovascular Diseases, not necessarily the views of the U.S. Department of Health and Human Services, the Health Resources and Services Administration, or the National Health Care for the Homeless Council, Inc.

PREFACE

Clinicians working in Health Care for the Homeless (HCH) projects and others who provide primary care to people who are homeless or at risk of homelessness routinely adapt their medical practice to foster better outcomes for these patients.

Standard clinical practice guidelines often fail to take into consideration the unique challenges presented by homelessness that may limit advanced diagnostic capabilities and the ability of patients to adhere to a plan of care. Recognizing the gap between standard clinical guidelines and clinical practices routinely used by health care providers experienced in the care of individuals who are homeless, the HCH Clinicians' Network has made the adaptation of clinical practice guidelines for homeless patients one of its top priorities.

Recommendations for the care of homeless adults with cardiovascular disease were initially developed in 2004 by primary care providers working in homeless health care across the United States. A second advisory committee, convened in 2009, reviewed and revised these recommended practice adaptations to assure their consistency with current clinical standards for the diagnosis and management of cardiovascular diseases commonly seen in homeless populations, and with best practices in homeless health care.

We offer this second edition of *Adapting Your Practice: Treatment and Recommendations for Homeless Patients with Hypertension, Hyperlipidemia and Heart Failure* to promote continuing improvement in the quality of cardiovascular care provided to adults whose lack of financial and social resources complicate the treatment and self-management of their chronic disease.

We hope these recommendations provide helpful guidance to primary care providers serving individuals who are homeless, and that they will contribute to improvements in both quality of care and quality of life for these patients.

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Care for Homeless Adults with Cardiovascular Disease: Summary of Recommendations

ASSESSMENT

History

- **Living conditions** – Ask at every visit: *Where did you stay last night? Where do you eat and spend time during the day? Is there a place to store medicine? How can you be contacted? Are you living alone?*
- **Medical** – heart/ lung disease, kidney/ liver problems, cardiac risk factors (high BP/ cholesterol, diabetes); hospitalizations; medications that may elevate blood glucose/ lipid levels (newer anti-psychotics); immunizations, allergies, prescription drug coverage, other health care providers
- **Mental health** – mental illness, head injury, problem with speech/ memory/ thinking/ interacting with others; education completed, special education, literacy. Ever treated for anxiety or depression? Feeling anxious or depressed? Assess ability to take pills daily and remember to return for follow-up.
- **Family** – high BP, heart attack, stroke?
- **Social** – cultural/ ethnic heritage
- **Diet** – Control over food choice and preparation? Foods high in cholesterol, saturated fats, sodium? Beverages containing alcohol, caffeine? Add salt to foods?
- **Smoking** – What do you smoke and in what form? Do you want help quitting?
- **Drug use** – alcohol, cocaine, caffeine, amphetamines, ephedra (cause/ exacerbate HTN, cardiomyopathy); IDU (risk of cardiac infection leading to heart failure). Comprehensive assessment by A&D counselor/ social worker optimal.
- **Activity level** – usual physical activities (e.g., walking: How far in blocks?)

Physical examination

- **Standard** – height, weight, BMI, % body fat, abdominal girth, heart, BP (with feet flat on floor, at least 1 hour after smoking or drinking caffeine), lungs, thyroid, abdomen, fundoscopic, peripheral pulses.
- **Dermatological** – acanthosis nigricans and skin tags, prevalent in metabolic syndrome
- **Oral** – poor dentition, oral lesions (periodontal disease and abscesses linked to CAD). Calcium channel blockers, blood thinners, meds that cause dry mouth may exacerbate gum problems.
- **Lungs** – rales (sign of heart failure); wheezes/ rhonchi (with concomitant COPD, common among homeless smokers)
- **Liver** – Hepatic congestion in right-sided heart failure may be difficult to differentiate from hepatomegaly due to underlying liver disease. Look for fluid waves.
- **Lower extremities** – Examine with shoes removed. Differentiate swelling due to heart failure from dependent edema secondary to sleeping upright on park benches, sitting in chairs, excessive walking. Pitting vs. non-pitting edema.

Diagnostic tests

- **Outreach settings/ clinics with limited laboratory access** – finger stick glucose checks, cholesterol screens, urine dips, Use glucometer, test strips, cholesterol/ lipid meter, Hemacue, throw-away HbA1c kits. Do blood work in shelter kitchens prior to breakfast/ evening meal; consider incentives.
- **General laboratory panels** – fasting lipid profile, fasting blood glucose, CBC, urinalysis, urine microalbumin: creatinine ratio annually, EKG; serum creatinine and potassium levels. If fasting is problematic, consider non-fasting glucose (100-125 for impaired fasting glucose, > 200 x 2, diagnostic for Type 2 diabetes), non-fasting total cholesterol and HDL, direct measurement LDL (if available, affordable).
- **Liver function test** – Reserve lab screening for patients meeting risk-based indications for testing. Assess for HBV, HCV, cirrhosis, if history of IDU/ alcoholism. Monitor closely if on statins,
- **Baseline CXR & EKG** – if suspected of heart failure. N.B.: cardiomegaly, prior MI, LVH, cardiac arrhythmia. (EKG may be difficult to interpret if no prior tracing for comparison.)
- **Echocardiogram** – Consider stress test if symptoms/risk factors for CAD.
- **Depression screening** – 9-item Patient Health Questionnaire (PHQ-9) or 2-item pre-screen (PHQ-2).
- **Cognitive assessment** – Mini-Mental State Examination (MMSE); assess regularly for cognitive impairment related to long-term alcohol/drug use, normal aging.
- **Test results** – Community Voice Mail (if available) to report test results, case manager to facilitate return to clinic. Provide latest BP, creatinine, potassium, cholesterol, lipoprotein levels on wallet-sized card.

MANAGEMENT

Plan of Care

- **Disease management goals** – standard BP, cholesterol, triglyceride goals. Homeless patient may require initiation of drug therapy sooner, less reliance on lifestyle modification. Try to determine etiology of heart failure (alcohol/ drug-related, HIV, CAD, hypertension, lung disease/ smoking).
- **Adherence** – At every visit, discuss plan of care; ask if anything is unclear or difficult; address obstacles to adherence. Explain risk of heart attack from high cholesterol/ triglycerides. Stress importance of adhering to plan of care even if you don't feel sick.
- **Benefits assistance** – Assess eligibility for Food Stamps, SSI/ SSDI, Medicaid/ Medicare, subsidized housing; help with applications.

Care for Homeless Adults with Cardiovascular Disease: Summary of Recommendations

Education/ self-management

- **Self-management goals** – Encourage selection of own goals; discuss how to accomplish. Weekly visit to check BP, review meds. Offer incentive if improvement noted.
- **Diet/ nutrition** – food preferences, appropriate diet, examples of healthy choices where food is obtained, portion control, preparation methods, how to interpret nutrition information on labels. Refer to nutritionist, preferably on clinical team. Advocate for more nutritious food in shelters and soup kitchens. Provide heart-healthy snacks. Help apply for Food Stamps.
- **Patient instruction** – simple terms, in patient’s first language; interpreter if needed. Ask to repeat instructions to assess understanding.
- **Written materials** – language-appropriate, simple terms, large print, graphic illustrations. Don’t presume can’t read/ understand just because homeless.
- **Portable information** – wallet-sized card specifying latest BP, creatinine, glucose, BUN, potassium levels; weight, cholesterol, lipoproteins.
- **Exercise** – benefits of aerobic exercise (may decrease swelling in legs/feet), where and how to do it. Alternatives to intensive weight-bearing for obese patients: chair exercises, leg lifts, hand weights (books, soup cans, water bottles).
- **Fluids** – If fluid restriction needed, specify amount to drink each day (more fluids during hot weather); provide reusable water bottle.
- **Health insurance** – If uninsured and eligibility likely, urge application/ reapplication for Medicaid, SSI/ SSDI—important for specialty referrals (diabetic educator, cardiologist).
- **Harm reduction** – Explain risks associated with HTN/ hyperlipidemia (heart attack, stroke, disability). Suggest strategies to minimize damage caused by alcohol, nicotine, other drugs. Stress importance of taking prescribed meds even while actively using. Use motivational interviewing to promote readiness for treatment/ therapy; list referral resources.
- **Weight measuring** – Teach how to check weight properly; allow self-checks in clinic without waiting. Explain implications of weight gain with worsening symptoms.
- **Education of food workers** – about dietary needs of CVD patients. Encourage more nutritious food options and preparation methods, use of salt substitute; provide samples. Collaborate with senior centers/ hospitals/ nutrition education programs to educate staff/ volunteers in shelters and soup kitchens.

Follow-up

- **Contact information** – Verify at every visit: phone/cell numbers, e-mail address; ask where staying, usually sleeps, obtains meals. Request address/ phone number of family member/ friend/ case manager with stable address to contact in an emergency.
- **Outreach, case management** – to facilitate adherence, follow-up care, referrals. Provide outreach to homeless shelters; invite residents to clinic for screenings; offer incentives (meal, transportation). Provide card with clinic location, phone number, hours of operation. Find creative ways to make patient want to follow up with you.

Health Care for the Homeless Clinicians’ Network

- **Frequency** – weekly/ biweekly/ monthly visits to monitor weight/ BP/ cholesterol control, increase rapport, reinforce understanding of care plan, identify and promptly address complications/ adherence problems. Encourage regular follow-up even if adherence is poor. Don’t be punitive; increase adherence by decreasing barriers to care.

TREATMENT

Medications

- **Diuretics** – can exacerbate dehydration; dangerous/ fatal levels of hyperpyrexia triggered by anticholinergic meds (phenothiazines) with diuretics in hot, humid environments. If limited access to water/ bathroom facilities or unable to return for lab tests, use alternative meds as appropriate. Advocate for easy access to potable water and restrooms for homeless persons.
- **Antihypertensives** – once daily dosing optimal. If trouble with adherence likely, use beta-blockers. Clonidine can alleviate withdrawal HTN in patients recovering from alcohol/ opioid addiction who are unable to obtain inpatient detox (commonly used to enhance/ prolong effects of heroin); use cautiously to avoid serious rebound HTN.
- **Statins** – Continue until LFTs 2–3 times normal limits barring complications. Monitor LFTs as appropriate, with awareness of increased risk for complications in patients with hepatitis, alcohol abuse. Less expensive alternatives: *Niacin* to lower LDL cholesterol, increase HDL cholesterol; *bulk laxatives* (psyllium) with low-fat diet to lower serum cholesterol with mild to moderate hypercholesterolemia (difficult if limited access to appropriate liquid/ toilet facilities); *metformin* to promote weight loss, preserve pancreatic function with Type 2 diabetes.
- **Simple regimen** – appropriate to diagnosis and living situation, considering availability, expense, side effects, duration of treatment. Daily dosing with evening meal, if possible. Consider combination meds (Beta blockers/ diuretics, ARBs/ diuretics, CCBs/ ARBs) available from patient assistance programs.
- **Dispensing** – Consider dispensing small amounts of medications to encourage return for follow-up, reduce risk of loss/ theft/ misuse.
- **Dosing frequency** – pre-filled, portable medication boxes if once-daily dosing impossible. If meds are stored in shelter, explain to staff why some residents need to take them more than once a day.
- **Pharmaceutical patient assistance programs** – reduced cost meds from drug companies, retail chains, 340B Drug Pricing Program (if eligible); help with applications. Use generics, if available and medically indicated. Consider free samples until continued supply of prescribed meds is available.
- **Immunizations** – influenza vaccine annually, pneumococcal vaccine according to standard clinical guidelines.

Care for Homeless Adults with Cardiovascular Disease: Summary of Recommendations

Associated problems, complications

- **Medication toxicity** – NSAIDs, cyclooxygenase-2 inhibitors, CCBs (especially diltiazem and verapamil), and diabetes medications (metformin, thiazolidinediones) may exacerbate heart failure.
- **Liver disease** – hepatitis B/C, alcoholic cirrhosis. Monitor liver function at baseline and 1–3 months following initiation of statin therapy.
- **Myopathy/ rhabdomyolysis** – from alcohol/ drug abuse, hepatitis, uncontrolled seizures; side effect of nefazodone, some HIV meds. Symptoms: muscle aches, soreness, weakness (may also be related to exertion, trauma, comorbidities). Monitor CK levels.
- **Edema** – Dependent edema may mask/ exacerbate edema due to heart failure. If no place to elevate feet during day, sit on ground to decrease swelling; if living in car, lie down with legs elevated on back of seat.
- **Orthopnea** – Educate shelter providers about need of persons with heart failure to sleep with head slightly elevated. Provide pillows if unavailable in shelters.
- **Physical/ cognitive limitations** – secondary to substance abuse/ trauma/ mental illness. Tailor plan of care to patient needs and capacities.
- **Literacy/ language limitations** – can lead to serious complications, loss to follow-up. Ask if patient has “trouble reading”; provide interpreter if English proficiency limited.
- **Multiple comorbidities** – MI, CVA, organ damage from uncontrolled CVD and comorbidities (emphysema, alcoholic cirrhosis, hepatitis, diabetes, HIV, psychiatric disorders). Cardiology referral for older patients with hyperlipidemia/ metabolic syndrome/ tobacco abuse/ family history of CAD.
- **Chemical dependencies** – Nicotine, alcohol, cocaine, amphetamines, ephedra contribute to cardiac arrhythmia, acute HTN, stroke, heart attack, cardiomyopathy, heart failure. Motivational interviewing to promote readiness for concurrent treatment of substance abuse and CVD.
- **Lost, stolen medications** – Public insurance may not cover replacement. Dispensing one-week supply can reduce risk of loss, improve adherence, allow for closer follow-up.
- **Transience** – increases risk of discontinuous, episodic, crisis care. Use incentives (food, coupons) to encourage follow-up. Provide pocket card listing latest test results, vital signs, current meds to document medical history for other providers.
- **Lack of transportation** – Provide carfare. Assess for mobility impairment; provide documentation to help impaired persons get mobility pass. Use outreach teams/ fire departments/ other agencies to monitor BP in the field.
- **Lifestyle limitations** – limited food choice, physical impairments, lack of safe place to exercise, inappropriate footwear. Educate about DASH diet and importance of limiting sodium intake; discuss feasible exercise alternatives.
- **Lack of housing and income** – Explore availability of low-barrier permanent housing with optional supportive services or convalescent care for patients with severe illness/ impairments. Document medical conditions and functional status with cognizance of disability criteria for SSI/ SSDI eligibility.

MODEL OF CARE

Outreach and Management

- **Outreach sites** – wherever homeless people congregate or receive services. Teach non-medical staff to measure BP; provide written notes to shelters requesting leg elevation privileges for persons with edema.
- **Clinical team** – outreach workers, case managers, mental health professionals, substance abuse counselors, nutritionist, medical and social service providers proficient in languages used by populations served. Involve patient in care planning and coordination to facilitate engagement, diagnosis, treatment, follow-up. Train clients as health promoters.
- **Nonjudgmental care** – essential for successful engagement in trusting therapeutic relationship, instrumental in motivating adherence to plan of care.
- **Incentives** – food and drink/ vouchers, hygiene products (toothpaste, hotel soaps/ toiletries, brushes, socks), subway/ bus cards/ tokens—to promote engagement
- **Patient privacy** – Be sensitive to self-consciousness about poor hygiene, possible history of interpersonal violence/ sexual abuse; bring homeless patients to examining room as soon as possible.

Service Delivery Design

- **Standard of care** – Elimination of health disparities between homeless and general population should be clinical goal.
- **Multiple sites** – Offer BP checks wherever homeless people receive services. Consider use of electronic medical records to promote continuity of care across service sites.
- **Integrated, interdisciplinary services** – Coordinate medical and psychosocial services across multiple disciplines and delivery systems, optimally accessible at same location. Resolution of homelessness should be a central goal of health care team.
- **Flexible clinic schedules** – Provide walk-in clinics/ designated slots or providers for walk-in patients so appointments aren’t necessary. Allow self-checking of BP in clinic on walk-in basis; patients with elevated BP should always be seen by a provider.
- **Early appointments** – If fasting, schedule for early clinic appointment. To make fasting easier, offer healthy snacks in clinic after diagnostic testing.
- **Hygiene** – Provide shower facilities at clinics and personal hygiene kits, where possible

INTRODUCTION

Diseases affecting the heart or blood vessels are highly prevalent among people experiencing homelessness (Burt, 1999; Gelberg, 1990; Hwang, 1999; Jones, 2009; Kim, 2008; Kinchen, 1991; Kleinman, 1997; Lee, 2005; Plantieri, 1990; Savage, 2006; Szerlip, 2002; White, 1997; Wright, 1990; Zerger, 2002). Among the cardiovascular diseases most commonly seen by primary care providers serving homeless individuals are *hypertension* (high blood pressure), *hyperlipidemia* (high cholesterol and triglycerides) and *heart failure* (impaired cardiac function, which often results from uncontrolled hypertension and/or hyperlipidemia). Metabolic syndrome—including hypertension, elevated triglycerides, increased abdominal fat, low HDL, and elevated fasting blood glucose—increases the risk for cardiovascular disease even further (Deen, 2004). An additional complication is the risk of hyperglycemia due to atypical and second generation anti-psychotic medications that many homeless people may be taking.

Heart disease is a leading cause of death for older homeless adults (45–60 years), and is three times more common among younger homeless adults (25–44 years) than in the age-matched general population (McCary, 2005; Hwang, 1997). Factors that contribute to homeless people's high risk for cardiovascular disease include heavy smoking (Cadzow, 2007); excessive use of alcohol, cocaine and other drugs that elevate blood pressure and damage the heart (Qureshi, 2006; McCary, 2005); poorly controlled hypertension, hypercholesterolemia and diabetes (Lee, 2005; Donohoe, 2004); poor diet and visceral obesity (Cadzow, 2007; Getz, 2007); chronic emotional or psychological stress (Cadzow, 2007; Kumar, 2008); limited access to preventive and remedial health care (Jones, 2009); and periodontitis, which is associated with atherosclerotic cardiovascular disease and is exacerbated by lack of oral health care (HCH Clinicians' Network, 2009; Friedewald, 2009).

Large studies of homeless populations have demonstrated that homeless adults are significantly more likely to have hypertension, at younger ages, than either the general population or low-income adults with stable housing (Burt, 1999; Gelberg, 1990; Hwang, 1999; Kinchen, 1991; Kleinman, 1997; Plantieri, 1990; Szerlip, 2002; White, 1997; Wright, 1990). A 1985–88 study of over 63,000 patients served by HCH clinics in 17 cities found that homeless adults were two to four times more likely to have hypertension than urban adult respondents to the National Ambulatory Medical Care Survey (NAMCS). Although the high rate of substance abuse was a major contributory factor to the elevated incidence of hypertension, even among non-alcohol-abusing homeless men, the rate of hypertension exceeded that reported for the general population by a factor of two (Wright, 1990). Researchers in San Francisco compared self-reported health conditions of 2,780 homeless adults (1990–93) to those reported by adult respondents to the National Health Interview Survey (NHIS). They found the number of homeless adults age 18–44 reporting high blood pressure to be 1.66 times as high as expected, using NHIS rates (White, 1997).

Subsequently, a retrospective study in New Orleans, comparing 100 patients seen at a homeless clinic with 200 matched domiciled patients at an inner-city primary care clinic, found hypertension

to be 1.78 times more common (65 percent vs. 52 percent) among the homeless patients (Szerlip, 2002). A 2002–2003 study of cardiovascular risk factors in a representative sample of homeless adults in Toronto (n=202) revealed higher rates of undiagnosed and undertreated hypertension among study participants than in the general population of Canada (Lee, 2005; McCary, 2005). Uncontrolled hypertension (blood pressure >140/90 mm Hg) can lead to other health problems, including stroke and kidney failure.

Other cardiovascular risk factors, such as hyperlipidemia, are also more prevalent among homeless adults than in the general adult population. Of 521 homeless adults included in a community-based study in Los Angeles, 36 percent under age 50, and 55 percent age 50 and older, had elevated cholesterol levels (Gelberg, 1990). By comparison, only 12 percent of all U.S. adults under age 45, and 25 percent of adults aged 45 and older had high serum cholesterol (1988–94), according to the National Health and Nutrition Examination Survey III (CDC, 2003). Homelessness is also associated with underdiagnosis and inadequate treatment of hypercholesterolemia. Investigators in Toronto found that of homeless adults with elevated LDL cholesterol levels for whom drug therapy was recommended, fewer than one-third reported taking aspirin or cholesterol-lowering medication (Lee, 2005).

Although the prevalence of heart failure among homeless people has not been documented, primary care providers serving these patients report that heart failure is frequently seen among middle-aged homeless adults secondary to alcohol use disorders and to chronic, uncontrolled hypertension and hyperlipidemia. Acute heart failure in homeless persons has been associated with endocarditis secondary to *Bartonella quintana*, a gram-negative bacterium transmitted by the human body louse that has been reemerging among homeless populations in urban areas of the U.S. and Europe (Foucault, 2006). Known risk factors for *Bartonella* endocarditis are alcoholism, homelessness, and body lice infestation.

Homeless persons often have poor dental health, related to a number of factors, including limited access to preventive oral health care (HCH Clinicians' Network, 2003; Dennis, 1991). This may place them at higher risk for atherosclerotic cardiovascular disease (CAD), as periodontitis (chronic gingival inflammation) is thought to be a risk factor or marker independent of traditional CAD risk factors (Friedewald, 2009; HCH Clinicians' Network Oral Health Task Force, 2009).

As in other populations, the prevalence of cardiovascular diseases increases sharply with age. Homeless adults have a higher risk for hypertension and heart disease, although they are chronologically younger than the general adult population. Three-fourths of surveyed homeless people nationwide and 63 percent of adults served by Health Care for the Homeless providers are under the age of 45, compared to about one-half of the U.S. population; and only 2–3 percent of homeless people are 65 or older, compared to about 12 percent of the general population (Burt, 1999; HRSA, 2007; 2000 Census). Although older homeless adults have a greater disease burden than their younger counterparts, even middle-aged homeless persons bear a higher risk for

morbidity and mortality secondary to heart disease than age-matched individuals in the general population (Garibaldi, 2005; Gelberg, 1990; Wright, 1987). Gelberg and colleagues (1990) observed that the health and functional problems of homeless adults in their forties and fifties resemble those of geriatric persons in the general population. It is noteworthy that homelessness among older adults is on the rise in the United States. Hahn and associates (2006) demonstrated a nine year increase in the median age (37–46) of 8,968 homeless individuals interviewed in San Francisco over a 14-year period, 1990–2003. The rate of aging in this homeless cohort exceeded that of the general population, consistent with homeless population trends in Los Angeles, New York City, St. Louis, Pittsburgh, and Toronto. This demographic shift is of particular concern because homelessness exacerbates chronic diseases that become more common with aging, including cardiovascular diseases.

Practitioners serving homeless people report that treatment of heart disease in these patients often requires earlier hospitalization than for domiciled patients due to their greater difficulty controlling sodium and fat intake and obtaining bedrest (Fleischman, 1992). Even when sufficiently motivated to reduce blood pressure or cholesterol levels through lifestyle changes, homeless individuals have difficulty maintaining weight reduction and low-sodium, low-fat diets (Dammann, 2009). Food selection in most shelters and soup kitchens is limited, and vigorous exercise may be constrained by the lack of comfortable walking shoes and socks or common, co-occurring musculoskeletal problems secondary to arthritis or injury (Wright, 1990).

The higher prevalence of behavioral health disorders among people experiencing homelessness also complicates the management of comorbid cardiovascular disease. A meta-analysis of the international literature on homelessness and serious mental disorders (1966–2007), including substance dependence, found that “homeless people in Western countries are substantially more likely to have alcohol and drug dependence than the age-matched general population in those countries, and the prevalences of psychotic illnesses and personality disorders are higher as well” (Fazel, 2008).

Approximately one in nine Americans aged 12 or older has substance dependence or abuse (SAMHSA, 2009), compared to an estimated one in three homeless clients (Burt, 1999). Smoking is far more common among homeless than domiciled people (Szerlip, 2002; Connor, 2002); about 70 percent of studied homeless populations smoke cigarettes (Lee, 2005; Szerlip, 2002; Sachs-Ericsson, 1999), compared to 21 percent of the general U.S. population (CDC, 2007). An estimated 20–25 percent of the homeless population in the United States suffers from severe mental illness, compared to only 6 percent of the general population (NCH, 2009). Persons with mental illness may have greater difficulty adhering to recommended lifestyle changes, medication regimens, and follow-up. Chronic mental stress may exacerbate cardiovascular risks by increasing blood pressure and accelerating atherosclerosis (Kumar, 2008; NHLBI, 2004). The body’s stress response may also cause fat to deposit around the abdomen, causing a higher strain on the heart (Cadzow, 2007).

When pharmacotherapy is indicated, homeless people may resist treatment or have extreme difficulty navigating the health care system and adhering to a medical regimen—particularly those who suffer from psychiatric illnesses, mental retardation, and/or substance dependence. Lacking resources and health insurance, and living in crisis, persons experiencing homelessness tend to seek care only in emergencies (Schanzer, 2007; Garibaldi, 2005; Donohoe, 2004). Storage space is limited, requiring them to carry medications with them; as a result, pills are often lost or stolen. Multi-dose regimens are confusing and especially challenging for homeless individuals. Poor water intake and lack of access to bathroom facilities complicate the use of diuretics. Despite these impediments, experienced homeless service providers and their clients have demonstrated that cardiovascular risks can be reduced and emergencies prevented with a comprehensive, culture-based, client-centered approach to care and self-management (Morrison, 2007; Martins, 2006; Plantieri, 1990).

Clinical practice guidelines for the management of cardiovascular diseases are fundamentally the same for all patients, regardless of their housing status. Nevertheless, primary care providers who routinely serve homeless patients recognize an increased need to take living situation and co-occurring disorders into consideration when working with these patients to develop a plan of care. The recommendations in this guide were developed to assist clinicians who provide cardiovascular care to homeless adults. It is our expectation that these simple adaptations of established clinical guidelines will increase opportunities for homeless patients to receive the optimum standard of care and ultimately reduce mortality as a result of cardiovascular disease.

Three primary sources for these adaptations are: the *Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* (JNC 7), May 2003 (www.nhlbi.nih.gov/guidelines/hypertension/index.htm); the *Third Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults* (Adult Treatment Panel III), May 2001 (www.nhlbi.nih.gov/guidelines/cholesterol/atp_iii.htm); and the *American College of Cardiology/American Heart Association 2009 Focused Update Incorporated Into the ACC/AHA 2005 Guidelines for the Diagnosis and Management of Heart Failure in Adults* (<http://content.onlinejacc.org/cgi/content/full/j.jacc.2008.11.013>).

Recommendations found in these standard clinical guidelines are not restated in this document except to clarify a particular adaptation for homeless patients or to identify higher health risks for homeless populations. The recommended practice adaptations are intended to supplement—not to supplant—the standard clinical guidelines listed above. For the convenience of clinicians, a summary of recommendations is presented at the beginning of this document, followed by more detailed, disease-specific recommendations and general recommendations describing the model of care that practitioners experienced in the care of homeless individuals consider essential to effective treatment. These general recommendations emphasize the importance of outreach and engagement skills, facilitating access to available housing, and modification of the traditional service delivery system to make it more accessible to people with a host of comorbid conditions who lack residential stability and control over other aspects of their lives.

CASE STUDY: HOMELESS ADULT WITH HYPERTENSION

Presentation: H.T. is a 45-year-old Caucasian male who came to the homeless clinic for refill of an antihypertensive medication (clonidine). Transient and without a regular source of care, he says that he has been out of his medication for 3 days. ("I feel bad and really need my blood pressure medicine.")

History of Present Illness: The patient reports a 10-year history of hypertension. Clonidine is "the only medication that has ever worked" to control his blood pressure, he says. He denies a history of myocardial infarction, stroke or diabetes mellitus. There is no information about previous providers.

Medical history: The patient has no known drug allergies. The patient limps, with some pain and unsteadiness, status post reconstruction of his left leg following a motor vehicle accident years ago.

Family History: He says there is a history of hypertension and substance abuse in his family.

Social history: H.T. smokes 1-2 packs of cigarettes per day and denies alcohol use or abuse. Although he has a history of opiate dependence and polypharmacy abuse, H.T. says he has been "clean for several years" after participating in several treatment programs. He is single and estranged from his family members, who have "plenty of money but are sick of me." New to town, he is currently living in an emergency shelter.

Review of Systems: denies chest pain; no shortness of breath or dyspnea on exertion; denies headache or visual problems.

Physical Examination: blood pressure 200/150; pulse 110; height 5'10"; weight 150#; BMI: 21.5
Appears older than stated age. Essentially normal exam otherwise (no heart murmur, lungs clear, no lower extremity edema, no focal neurologic findings) and no acute changes evident on EKG.

Labs in clinic: Urinalysis negative for protein or hematuria.

Assessment: hypertensive urgency; suspected misuse of clonidine.

Plan of care: recommended immediate referral to emergency room of local hospital for urgent antihypertensive therapy.

Outcome: After repeated but unsuccessful attempts to persuade the patient to go to the ER, he was treated in the clinic. It took several hours to bring his blood pressure below a dangerous level using the available medication, clonidine. On subsequent visits he had persistent labile hypertension and resisted any attempts to try other medications. Eventually, H.T. admitted to seeking clonidine from multiple providers and identified its use as "an addiction." [Although clonidine is not known to have addictive properties, it is frequently sold on the street to extend the effects of heroin and reduce withdrawal symptoms for persons addicted to opioids. Withdrawal of clonidine can cause rebound hypertension, making the abnormal BP worse than without medication.]

Abby Hale, PA-C, Community Health Center of Burlington, Vermont, 2003

Hypertension in Homeless Adults

Diagnosis and Evaluation

HISTORY

- **Chief Complaint & History of Present Illness** At the beginning of every visit, ask how the patient has been feeling and how s/he feels right now.
- **Living Conditions** At every visit, ask where the patient is staying (“describe the place where you sleep”), where s/he spends time during the day, and how s/he can be contacted. Ask explicitly about access to basic needs (food, shelter, restrooms, and a place to store medications). Lack of stable housing complicates health care and adherence to treatment. Try to ascertain if the patient lives alone or if s/he lives with friends or family.
- **Medical history** Ask whether the patient has ever had high blood pressure, a heart attack, or stroke. Ask about other cardiac risk factors, including diabetes, high cholesterol, and chest pain. Acuity and multiplicity of health problems often seen in homeless patients and sporadic follow-up make good history taking and prioritization of treatment goals especially difficult.
- **Family history** Ask if anyone in the patient’s family has had hypertension, a heart attack, or stroke.
- **Dietary history** Explore the patient’s diet. Ask where meals are obtained (e.g., soup kitchens, shelters, missions) and what the patient eats. Ask specifically about foods high in sodium, cholesterol or saturated fats. Ask about dietary choice, control over food preparation, and use of added salt. Ask about cultural/ethnic heritage. Food preferences of particular groups, including Hispanics and African Americans, can be high in saturated fat and sodium.
- **Alcohol/drug use** Ask about use of substances that can cause or exacerbate high blood pressure. Ask about alcohol use and when the patient’s last drink was (high blood pressure is often seen during periods of withdrawal from alcohol use). Ask about other drug use—especially stimulants such as cocaine, ephedra, caffeine (including energy drinks that contain caffeine), and amphetamines. Look for anything that may complicate treatment adherence (e.g., smoking, obesity, alcohol, other addictive or sedative substances). Assessment of substance use can be conducted through patient written self-report, nursing triage, or social service screening. If possible, seek assistance from a drug and alcohol counselor or social worker to complete a comprehensive assessment.

- **Smoking** Ask whether and what the patient smokes. Smoking is more common among homeless than domiciled people and often begins at a younger age. Homeless people are known to use inexpensive brands of cigarettes that are especially high in tar/nicotine, and often smoke substances other than nicotine that may increase their risk for cardiovascular disease. They may also reuse cigarettes (pick up cigarette butts from streets/gutters) and use nontraditional “rolling paper” (such as newspaper) that may contain more toxins than standard brands.
- **History of mental illness/cognitive deficit** Ask whether the patient has ever been told s/he had a mental illness, traumatic brain injury, or cognitive impairment (problem with speech, memory, thinking, or interacting with others). Inquire about level of education completed, participation in special education, and current ability to read. Ask if ever treated for depression or anxiety, and if currently feeling anxious or depressed. Assess the patient’s ability to take pills daily and remember to return for follow-up care.
- **Prior providers** Inquire about other health care providers the patient has seen, recognizing the mobility of homeless people.
- **Activity level** Ask the patient to describe usual physical activities (e.g., walking – how far in blocks). Knowledge of activity level can be useful in designing an exercise program.
- **Prescription coverage** Ask whether the patient has health insurance that covers prescription drugs. If not, provide assistance in applying for Medicaid and other governmental health programs for which s/he may be eligible. Consider patient assistance programs provided by pharmaceutical companies and large retail chain pharmacies (e.g., Wal-Mart, Target, Ralphs).

PHYSICAL EXAMINATION

- **Standard exam** Vital signs including properly measured blood pressure and heart rate, peripheral pulses, lungs, abdomen; limited fundoscopic exam for papilledema or nicking; arms and legs for swelling; skin for cholesterol deposits (xanthomas), acanthosis nigricans and skin tags (indicative of metabolic syndrome). Check blood pressure with the patient’s feet flat on the floor, at least one-half hour after smoking or drinking caffeine.
- **Lower extremities** Examine with shoes removed. Differentiate swelling due to heart failure from dependent edema secondary to sleeping upright on park benches, sitting in chairs, excessive walking. Pitting vs. non-pitting edema.

DIAGNOSTIC TESTS

- **General laboratory panels** Obtain fasting lipid profile, fasting blood glucose, complete blood count, urinalysis, urine microalbumin: creatinine ratio annually, and electrocardiogram. Measure serum creatinine, sodium, calcium, and potassium levels according to standard clinical guidelines (a chemistry panel may be less expensive). No homeless-specific adaptations recommended. Screen for diabetes according to standard American Diabetes Association clinical guidelines. If fasting is problematic, consider non-fasting glucose (100–125 for impaired fasting glucose, > 200 x 2, diagnostic for Type 2 diabetes), non-fasting total cholesterol and HDL, and direct measurement of LDL (if available, affordable).

Triglycerides should only be measured fasting. Since calculation of indirect LDL is based in part on the triglyceride level, indirect LDL (the standard approach) should only be determined with a fasting blood sample. Consider using Clinical Laboratory Improvement Amendment (CLIA) waived (point of care) diagnostic tests such as CardioChek® to measure cholesterol/lipids. These point-of-care tests are often rapid, simple to use, and less expensive than office-based laboratory testing.

- **Depression screening** The Health Disparities Collaboratives recommend that depression screening be integrated into all chronic care. Many popular and well-validated screening tools are available for use in any primary care population. National measures recommended by the Health Disparities Collaborative on Depression are based on the 9-item Patient Health Questionnaire (PHQ-9), a depression scale developed for primary care based on DSM-IV criteria for diagnosing major depression. The PHQ-9 is available at: www.depression-primarycare.org/clinicians/toolkits/materials/forms/phq9/ A 2-item pre-screen (PHQ-2) has also been validated for use in primary care (Staab and Evans, 2000).
- **Cognitive assessment** Regularly assess for cognitive impairment related to long-term alcohol/drug use or normal aging, which may affect adherence to treatment regimens. The Mini-Mental State Examination (MMSE) is a widely used assessment tool for adults. Information about how to obtain it is available at: www.minimental.com/.
- **Test results** Make it easy for patients to get laboratory test results; use case managers to bring the patient back to clinic for test results and further treatment. Provide the patient with a copy of test results on a wallet-sized card, including latest blood pressure measurement, creatinine and potassium levels, high/low density lipoproteins (HDL/ LDL), and cholesterol/triglycerides, to document medical history for the next care provider. Use Community Voice Mail (www.cvm.org/), if available, to report test results, leave instructions for follow-up visits, or record appointment reminders. Post notes with colored-coded dots to remind clinic staff of the patient's service needs.

Plan and Management

PLAN OF CARE

- **Nutrition referral** Refer the patient to a nutritionist, preferably a member of the clinical team, who is knowledgeable about the limited food choices that homeless people typically have.
- **Adherence** At the end of every visit, discuss the plan of care with the patient; ask if anything about it is unclear or difficult, and work with him/her to address obstacles to adherence. Recognize that lifestyle changes (reduced fat intake, weight control, increased exercise) are especially difficult for homeless individuals, and that food provided by shelters and soup kitchens is not always conducive to cardiovascular health.
- **Benefits assistance** Assess the patient's likelihood of qualifying for Food Stamps and other benefits (SSI/SSDI, Medicaid/Medicare, subsidized housing) and help him or her complete necessary paperwork.

EDUCATION, SELF-MANAGEMENT

- **Self-management goals** Encourage the patient to select his/her own goals, even if they differ from the providers' goals or are prioritized differently. Ask what s/he would like to work on (e.g., lose 5 pounds this month), and discuss how to accomplish this. (See Morrison, 2007 for more tips about helping patients set goals to improve their health.) When a goal is chosen, help the patient overcome barriers to achieving it. Begin with simple tasks. Encourage weekly clinic visits to check blood pressure and review medications (explain the purpose of each medication and how to take it). A color-coded system can help patients who have trouble reading (e.g., "the green pill is for your blood pressure and is taken once in the morning. The pink pill is also for your blood pressure, but it helps your kidneys too and is taken once in the morning"). If possible, supply a pill box ("med minder") and demonstrate how to fill it. Ask the patient to explain or demonstrate the information conveyed to assess understanding.
- **Dietary practices** Learn what the patient's dietary practices and food preferences are and assess his/her knowledge of nutrition. Provide information about good food choices and preparation methods, individually and in group settings. Use samples of packaged or canned food items commonly consumed to teach how to interpret nutrition information on labels (e.g., sodium content in ketchup). Give examples of healthy food choices in settings where s/he obtains food. Discuss portion control ("Eat half of what is on your plate"). Recommend not adding salt to food after preparation. Encourage use of salt substitutes and extra servings of vegetables and fruits instead of fatty meats in accordance with the Dietary Approaches to Stop Hypertension (DASH) eating plan (www.nhlbi.nih.gov/health/public/heart/hbp/dash/new_dash.pdf). If not already receiving Food Stamps, encourage the patient to apply to help supplement shelter food.

- **Patient instruction** Explain hypertension and its risks in language the patient can understand. Use illustrations to facilitate comprehension. If giving written instructions, make sure the patient can read and understand them.
- **Written materials** Be aware that some homeless patients do not read well in English or at all, are poorly educated, have cognitive deficits secondary to comorbidities, lack corrective lenses, or have blurred vision as a complication of hypertension and diabetes. But recognize that like other people, those who are homeless vary widely in intelligence, education, and literacy; don't presume that a patient can't read or understand written information just because s/he is homeless. Provide educational materials in the first language of patients you serve, using simple terminology and large print with graphic illustrations to compensate for any visual limitations – e.g., handouts describing the DASH diet, ideas for sodium restriction, recommended exercise program, effects of alcohol and smoking on cardiovascular health. (Patient education resources on smoking cessation and other topics are available at www.musc.edu/pprnet/education.html. Easy-to-read materials on alcohol-related topics are available in English and Spanish at www.niaaa.nih.gov/Publications/PamphletsBrochuresPosters/English/)
- **Portable information** Give patients a written summary of their latest test results that can be carried with them – e.g., a wallet-sized card specifying blood pressure measurement, creatinine glucose and potassium levels, weight, cholesterol and lipoproteins.
- **Exercise** Counsel patients to increase aerobic exercise. Give examples of how to do this (e.g., “Walk from 1st street to 6th street and back, which equals a mile; or walk up and down 4 flights of stairs.”) Explain that walking may help to decrease swelling of the legs and feet. Recognize that obese patients may develop other problems when attempting intensive weight-bearing exercise. Work with these patients to develop alternative forms of exercise to promote cardiovascular health, such as chair exercises, use of hand weights (books, soup cans, plastic bottles filled with water), and leg lifts.
- **Harm reduction** Explain risks associated with hypertension and substance use (see Associated Problems). Use a harm reduction approach to use of alcohol, nicotine or other drugs that independently cause or exacerbate high blood pressure. Encourage patients to reduce substance use and/or use less harmful drugs (e.g., name brand cigarettes instead of cheaper brands with higher tar/nicotine content). Explain that it is even more important to keep taking prescribed antihypertensives while actively using these substances. At every visit, reiterate the risks that hypertension poses (e.g., heart attack, stroke). Emphasize the risk of disability from a stroke (paralysis, incontinence); homeless people may be less concerned about mortality risk than about chronic disability.
- **Education of food workers** Educate staff and volunteers at shelters and soup kitchens about the dietary needs of persons with cardiovascular disease, and work with them to promote more nutritious food options and preparation methods. Explain how to provide low sodium, low

cholesterol meals – e.g., sugar-free gelatin with fruit, chicken baked without the skin instead of fried chicken, seasoning with spices instead of salt. Encourage food programs to put a salt substitute on the table; spotlight one dish each week that is low in salt or fat and list salt/fat content; provide samples of healthy foods for patients to taste. If possible, collaborate with nutrition education programs at local universities, junior colleges, senior centers, or hospitals; engage students or volunteer dietitians as consultants to workers who prepare food. (HCH Clinicians' Network, 2001)

MEDICATIONS

- **Diuretics** Although thiazide diuretics (HCTZ) are widely recommended as a first-line agents for Stages 1 and 2 hypertension, these medications can increase the risk of dehydration for persons living on the streets or in shelters in warmer climates, particularly during summer months. Diuretics are safe to use in most patients, but be aware that in combination with some of the anti-cholinergic drugs and lithium they can exacerbate dehydration, and that limited access to water or bathroom facilities may interfere with treatment adherence. Work with service providers in your community to assure that homeless people have easy access to potable water and restrooms. Consider providing re-usable water bottles. Avoid prescribing diuretics if the patient does not have easy access to a restroom or will not be able to return for laboratory tests necessary for monitoring them. Electrolytes and hydration status should be checked within 2 weeks of starting diuretics. Simple urine dips can be performed at outreach sites on all persons taking medications for blood pressure. No one should be started on a diuretic without baseline serum electrolytes and a 2-week follow-up to assess kidney function. Patients with kidney disease should not be started on diuretics. Consider purchasing a CLIA-waived point-of-care electrolyte machine to perform this test in your clinic.
- **Antihypertensives** Be cautious about prescribing beta-blockers or clonidine pills to homeless patients likely to have trouble with adherence, since discontinuing these medications suddenly can result in serious rebound hypertension. At initiation, beta-blockers can exacerbate depression. Be aware of the potential for clonidine to be sold on the streets in order to decrease the withdrawal effects of heroin and other opioids (nausea, cramps, sweating, tachycardia, hypertension). If clonidine is contraindicated, explore alternative strategies to reduce high blood pressure.
- **Simple regimen** Use the simplest medical regimen possible to facilitate treatment adherence. If possible, prescribe long-acting antihypertensive medications that can be taken once instead of several times a day. (See: www.nhlbi.nih.gov/guidelines/hypertension/express.pdf for currently recommended treatment options.) For stage 2 or persistent stage 1 hypertension, consider using combination medications, such as beta-blockers/diuretics (e.g., Lopressor HCTZ), angiotensin receptor blockers/diuretics (e.g., Atacand HCTZ, Avalide) or calcium-channel blockers/angiotensin receptor blockers (e.g., Exforge) if possible. These medications are often available free or at low cost from pharmaceutical patient assistance programs.

- **Dispensing** Consider dispensing small amounts of medications at a time to ensure return for follow-up, recognizing the potential for lapses in adherence if obtaining prescribed medications is difficult for the patient. Homeless patients frequently lose medications if larger quantities are provided. Some patients sell their antihypertensive drugs; giving them a week's supply at a time can decrease this risk.
- **Dosing frequency** If once-a-day dosing is not possible to achieve blood pressure goals, use pre-filled medication boxes with daily slots which the patient can remove and carry with him/her. Recognize that shelters commonly require overnight residents to leave early each morning, with the doors opening again in the late afternoon. If medications are stored in a shelter, explain to shelter staff why some persons need to take medications more frequently than once a day.
- **Alcohol/drug use** For patients recovering from alcohol or opioid addiction who are unable to obtain inpatient detoxification, withdrawal hypertension can be safely alleviated with clonidine pills or patches, closely monitored. Be aware that clonidine itself can be abused, usually by heroin users, who may use it to reduce the amount of heroin necessary for the desired effect or to prolong heroin's action.
- **Pharmaceutical patient assistance programs** If the patient does not have prescription drug coverage and is ineligible for Medicaid or other public health insurance, consider using pharmaceutical companies' patient assistance programs (www.needymeds.com), or discount pharmaceutical programs offered by large retail chains (such as Wal-Mart, Target, or Ralphs), and/or the U.S. Department of Health and Human Services 340B Drug Pricing Program, if eligible (www.hrsa.gov/opa/). Prescribe generic medications if available and medically indicated. Consider use of free drug samples until a continued supply of the prescribed medication is available. If possible, provide dedicated staff or volunteers to help patients apply for pharmaceutical discount programs.

ASSOCIATED PROBLEMS, COMPLICATIONS

- **Physical/cognitive limitations** Disabilities secondary to chronic illness or injury, frequently seen in homeless patients, can limit their capacity to follow a plan of care. Physical impairments, lack of facilities, and unsafe living environments may limit exercise alternatives. Cognitive deficits secondary to substance abuse, trauma, mental illness or medication side effects may limit understanding of the disease process and compromise adherence to treatment. Tailor the plan of care to patient needs and capacities.
- **Literacy/language limitations** A number of homeless people have difficulty reading but may not volunteer this information out of embarrassment or shame. They may be illiterate or have a low literacy level in their primary language and/or in English, if it is not their native tongue. Assuming erroneously that the patient can read directions on medicine bottles or an

appointment card can lead to serious complications and loss to follow-up. Ask if the patient has “trouble reading” at intake. Provide an interpreter for patients with limited English proficiency.

- **Multiple comorbidities** Homeless people are at risk for myocardial infarction, stroke, and organ damage from uncontrolled CVD and comorbidities (emphysema secondary to smoking, cirrhosis of the liver secondary to alcoholism or hepatitis). Recognize and address lifestyle factors and barriers to treatment and self-care that increase risk for negative health outcomes.
- **Chemical dependencies** Be aware that substance use disorders, frequently seen in homeless patients, are medical problems that contribute to cardiovascular disease. Nicotine is the addictive drug most frequently used by homeless people. Smoking elevates blood pressure and pulse rate, contributing to heart attack and stroke. Excessive alcohol use can result in cardiomyopathy, which may lead to heart failure. Cocaine, amphetamines, and dietary supplements used for weight loss (ephedra, ma huang, “white crosses”) cause cardiac arrhythmia, acute hypertension, stroke, and heart attacks. Uncontrolled withdrawal from excessive alcohol or drug use can result in rebound hypertension. Use motivational interviewing to promote readiness for concurrent treatment of substance use and high blood pressure (Morrison, 2007; Miller and Rollnick, 2002).
- **Lost, stolen medications** Living in shelters and on the street increases risk of medication loss, theft, or misuse. Consider dispensing smaller amounts of medications to improve adherence and allow for closer follow-up. Loss of medication can be a problem when public health insurance does not allow for replacement; use 340B Drug Pricing Program or other source of free/reduced-cost medications. Federally Qualified Health Centers are sometimes able to purchase medicines that are not covered by health insurance.
- **Transience** Recognize that the mobility of homeless patients may compromise continuity of care and make routine management of hypertension less likely than episodic, crisis care. Use positive incentives to encourage follow-up (e.g., food or coupons). Provide each patient with a pocket card listing latest test results, vital signs, and current medications to document medical history for the next care provider.
- **Lack of transportation** Homeless persons may be unable to return to the clinic due to lack of funds for transportation and/or disabilities that create additional barriers to use of public transportation. Assess for mobility impairment; provide required documentation to assist impaired patients in getting a mobility pass. Provide carfare to facilitate follow-up. Monitor blood pressure in the field, using outreach teams; network with fire departments and other agencies willing to check homeless people’s blood pressure.

- **Lack of housing and income** Work with members of the clinical team, including outreach workers, to facilitate entry into permanent housing. Explore the availability of housing first¹ models or medical respite care² for individuals with severe illness. Document the patient's medical conditions and functional status with cognizance of disability determination procedures required for SSI/SSDI.

FOLLOW-UP

- **Outreach, case management** Work with case managers and outreach workers to facilitate treatment adherence and follow-up care, including referrals to other facilities. Provide outreach to homeless shelters; invite residents to obtain needed screenings in clinic settings; offer a meal and transportation back to the shelter as incentives.
- **Frequency** Consider more frequent (monthly) follow-up visits to increase monitoring of blood pressure control and treatment adherence. Keep lines of communication open and encourage regular follow-up, even if the patient does not adhere to treatment. Don't be punitive; work with the patient to increase adherence by decreasing barriers to care.
- **Contact information** Verify contact information at every visit. Ask where the patient is staying (shelter, street or other locations where s/he usually sleeps or obtains meals) and how to contact (phone/cell number, e-mail address). Request address/phone number(s) of a family member/friend/ case manager with a stable address to contact in an emergency. If the shelter has Community Voice Mail available, provide information about how to sign up for this service.

All recommendations for the treatment of homeless patients with hypertension presuppose use of the Model of Care described on pages 32 and 33 of this document.

¹ **Housing first** is an approach to supportive housing characterized by barrier-free access to permanent housing directly from shelters or the streets with no pre-requisite to achieve sobriety or attain a level of stability before housing is offered. Once housed, residents have voluntary access to a range of health and social services designed to promote housing stability. (Post, 2008; see also www.endhomelessness.org/section/tools/housingfirst)

² **Medical respite care** is acute and post-acute medical care for patients experiencing homelessness who are too ill or frail to recover from a physical illness or injury while living in shelter or on the streets, but who are not sick enough to be in a hospital. Medical respite programs provide short-term residential care that allows homeless individuals the opportunity to rest in a safe environment while accessing medical care and other supportive services. (See Ciambone, 2009 and other resources available at: [www.nhchc.org/Respite/.](http://www.nhchc.org/Respite/))

CASE STUDY: HOMELESS ADULT WITH METABOLIC SYNDROME

Presentation: 47 year-old homeless African American requests a blood pressure check.

Medical and family history: 10-year history of hypertension, no current medications due to transient living conditions. Unsure of medications used in the past. Denies history of cardiovascular disease, diabetes, cancer, asthma, hyperlipidemia, myocardial infarction, or chest pain. No hospitalizations. Positive family history for hypertension, cardiovascular disease, Type 2 diabetes, and drug/alcohol abuse, but no cancer.

Mental health/substance use history: Tobacco use: 20 pack-years. No desire to quit, as considers it a stress reducer while recovering from drug abuse. Weekly-to-monthly crack cocaine use for 7-10 years. 3-month (current) participation in residential drug/alcohol treatment program. No history of psychiatric illness.

Psychosocial history: Homeless for 10 years. Lost welfare benefits for nonadherence to work program requirements; current residential drug treatment program does not allow recipients to obtain welfare. Only social supports are "drinking buddies"; no family contact for years. Eats in soup kitchens/ shelters; walking moderate distances required to reach them.

Review of systems: Essentially benign except for positive dyspnea on exertion and shortness of breath, which the patient attributes to his weight. No orthopnea; able to sleep supine on 2 pillows. No cough, nausea, vomiting, diarrhea, headaches, polyphagia, or visual changes. Admits to polydipsia and polyuria.

Physical exam: weight 240#, height 70", Body Mass Index (BMI) 34.4, percent body fat 42, abdominal girth 49", blood pressure 137/92, heart rate 72 (regular rate and rhythm). No edema in lower extremities, +3/4 pulses. All other findings within normal limits.

Labs: Fasting Blood Sugar (FBS) ↑160; total cholesterol ↑267; triglycerides ↑1107; High Density Lipoprotein (HDL) ↓23; unable to calculate Low Density Lipoprotein (LDL) due to high triglyceride level; cholesterol/HDL risk ratio ↑11.6; glycohemoglobin A1c 7.1; mean blood glucose 150. Liver function tests, creatinine, microalbumin normal.

Clinical assessment: Metabolic Syndrome (Type 2 diabetes mellitus, stage 1 hypertension [untreated], obesity, atherogenic dyslipidemia); nicotine and cocaine dependence.

Plan of care: Treatment goals: for patient with Type 2 diabetes (CAD equivalent), LDL goal is <100; non-HDL cholesterol goal is <130. Rx: pravastatin 40 mg at bedtime, Slow-Niacin 500 mg twice a day, monopril 20 mg daily (available at no cost with minimal requirements through pharmacy drug assistance program). Consider beginning metformin 500 mg daily for diabetes, although lipid control expected to reduce glucose level; stress diet and exercise, recognizing need to reduce elevated triglycerides, and surveillance of possible end organ damage. Return to clinic monthly. Explain importance of evaluating medications, lab results, and possible side effects/disease symptoms, especially if lapse in recovery from alcohol/drug use. Discuss nonjudgmentally; encourage return to clinic if relapse occurs. Repeat lipid profile in 4-6 weeks to evaluate LDL/VLDL levels when triglycerides are lower, and LFTs; also check creatine kinase (CK) if there are symptoms of myopathy. Educate patient, shelter kitchen staff about dietary needs: low fat, low salt, ADA diet.

Aaron Strehlow, PhD, FNP-C, RN – UCLA School of Nursing Health Center, Los Angeles, California, 2003

Hyperlipidemia in Homeless Adults

Diagnosis and Evaluation

HISTORY

- **Living conditions** Lack of stable housing complicates health care and adherence to treatment. At every visit, ask where the patient is staying (“describe the place where you sleep”), where s/he spends time during the day, and how s/he can be contacted. Ask explicitly about access to basic needs (food, shelter, restrooms, and a place to store medications).
- **Medical history** Ask if the patient has ever been told s/he had hypertension, cardiovascular disease, coronary artery disease, diabetes, kidney or liver disease. Determine the patient’s age, recognizing that many homeless adults appear to be older than their chronological age. Ask about current medications, including any drugs taken for mental health (which s/he may be reluctant to reveal), recognizing that some antipsychotic drugs elevate blood glucose and lipid levels.
- **Family history** Ask about individual/family history of hypertension, cardiovascular disease, coronary artery disease, diabetes, kidney or liver disease.
- **Social history** Inquire about the patient’s cultural heritage, recognizing that food preferences of particular cultural/ethnic groups, including Hispanics, African Americans, can be very high in saturated fat and sodium.

Diet Ask the patient to describe what s/he eats and drinks over a 24-hour period. Ask specifically about foods high in cholesterol, saturated fats or sodium, and about beverages containing alcohol or caffeine. Ask where the patient eats (e.g., soup kitchens, shelters, missions), types of food typically served, how foods are prepared, and whether salt is added.

Activity level Ask the patient to describe his/her usual physical activities (e.g., walking—how far in blocks?). Knowledge of activity level can be useful in designing an exercise program.

Smoking Ask whether and what the patient smokes. Smoking is more common among homeless than domiciled people and often begins at a younger age. Homeless persons are known to use inexpensive brands of cigarettes that are especially high in tar/nicotine, and often smoke other substances that may increase their risk for cardiovascular disease. They may also reuse cigarettes (pick up cigarette butts from streets/gutters) and use nontraditional “rolling paper” (such as newspaper) that may contain more toxins than standard brands.

- **Alcohol/drug use** Explore possible alcohol/drug use. Ask if the patient drinks alcohol, and if so, how much and how often. This may affect the decision to prescribe statin medications, which may be contraindicated by altered liver function tests.

PHYSICAL EXAMINATION

- **Standard exam** Measure the patient's height, weight, Body Mass Index, percent body fat, abdominal girth, blood pressure, and heart rate; perform carotid auscultation for a bruit, cardiac auscultation for an S4; check peripheral pulses.
- **Lower extremities** Look for swelling in lower extremities; try to differentiate dependent edema from swelling due to heart failure.
- **Dermatological exam** Examine the skin for acanthosis nigricans and skin tags, which are prevalent in metabolic syndrome.
- **Oral exam** Look in the patient's mouth for plaque and calculus, which are comparable to HDL, LDL and total cholesterol values as indicators of cardiac health (Janket, 2004). Be aware that certain medications, (e.g., calcium channel blockers, blood thinners, medications that cause dry mouth) may cause gum problems (HCH Clinicians' Network Oral Health Task Force, 2009).

DIAGNOSTIC TESTS

- **In Outreach settings or clinics with limited access to a formal laboratory** Perform finger stick glucose checks, cholesterol screens, urine dips. Invest in a glucometer, test strips, cholesterol/lipid meter, Hemaccue, and throw-away HgA1c kits.
- **Fasting labs** Recognize that obtaining fasting blood samples may be difficult (some soup kitchens serve meals early; requiring homeless patients to fast may prevent them from getting something to eat until many hours later). Send a nurse to the shelter or food kitchen to take a blood sample prior to breakfast or the evening meal. If obtaining a fasting lipid panel is not feasible, consider measuring total cholesterol, HDL cholesterol, and direct LDL (if available), which do not require fasting. (Disadvantages to this alternative: LDL is generally more expensive, and triglyceride measurement cannot be obtained from a non-fasting blood sample.) Collaborate with outreach workers and shelter staff to help get patients to the clinic; offer incentives. When patients come in for blood work, do tests immediately; don't make them wait. Consider using CLIA waived point of care diagnostic tests such as CardioChek® to measure cholesterol/lipids. These tests are rapid, simple to use, and less expensive than office-based laboratory testing.

- **Liver function tests (LFTs)** Assess for liver disease, especially in persons using alcohol or with a history of injection drug use. LFTs should be monitored in patients on statins, which can exacerbate pre-existing liver disease. Consider continuation of treatment until LFT's are 2–3 times normal limits barring other complications. Recognize that many homeless people have hepatitis. Question homeless patients routinely about behaviors that place them at high risk for hepatitis B and C, but reserve laboratory screening for those meeting risk-based indications for testing, to minimize false-positive test results and attendant costs to clarify results.
- **Cognitive assessment** Regularly assess for cognitive impairment related to long-term alcohol/drug use or normal aging, which may affect adherence to treatment regimens. The Mini-Mental State Examination (MMSE) is a widely used assessment tool for adults. For information about how to obtain it, see: www.minimental.com/.
- **Test results** Make it easy for patients to get test results. Use case managers to facilitate their return to the clinic for results and further treatment. Use Community Voice Mail (www.cvm.org/), if available, to report test results, leave instructions for follow-up visits, or record appointment reminders. Give patients a copy of their latest blood pressure measurement, creatinine and potassium levels, weight, cholesterol and lipoprotein levels on a wallet-sized card.

Plan and Management

PLAN OF CARE

- **Lipid goals** Use the standard formula to calculate cholesterol and triglyceride goals (ATP III Update 2004: www.nhlbi.nih.gov/guidelines/cholesterol/atp3upd04.pdf). Although achieving these goals can be more challenging when treating individuals who are homeless, the same standard of care applies to all patients. Practitioners who provide health care to homeless people may rely less on lifestyle modification and move to drug therapy sooner, within alternatives specified by standard clinical guidelines.
- **Adherence** Help the patient to understand the importance of adhering to the plan of care, recognizing that hyperlipidemia is an asymptomatic disease and that people with high blood cholesterol/triglycerides usually feel fine. Talk about the patient's risk for a heart attack and specify that risk numerically, using tables in the standard guidelines. At the end of every visit, discuss the plan of care; ask if anything about it is unclear or difficult, and work with the patient to address obstacles to adherence. Recognize that lifestyle changes (reduced fat intake, weight control, increased exercise) are especially difficult for homeless individuals, and that food provided by shelters and soup kitchens is not always conducive to cardiovascular health.

EDUCATION, SELF-MANAGEMENT

- **Self-management goals** Help the patient develop self-management goals, including strategies to promote weight loss and reduce intake of fatty acids and cholesterol. Set goals in collaboration with the patient. Ask what s/he would like to work on; when a goal is chosen, help the patient overcome any barriers to achieving it. Offer an incentive at the next follow-up if improvement is noted. (Morrison, 2007)
- **Exercise** Encourage aerobic exercise and give examples that are feasible for the patient (e.g., “Walk from 1st street to 6th street and back, which equals a mile; or walk up and down 4 flights of stairs.”) Explain that walking may help to decrease swelling of the legs and feet. But recognize that for obese patients, engaging in intensive weight-bearing exercise may result in other problems, such as arthritis. Explore other ways to promote movement with these patients, such as chair exercises, lifting hand weights (soup cans, full water bottles), and leg lifts.
- **Diet/nutrition** Give examples of healthy dietary choices in settings where the patient obtains food – e.g., encourage extra servings of vegetables and fruits instead of fatty meats. Discuss portion control (“Eat half of what is on your plate”). Refer the patient to a nutritionist, preferably on the clinical team, who understands the limited food choices that homeless people typically have. Provide heart-healthy snacks in the clinic as positive incentives. Enlist students or volunteer dietitians to educate staff and volunteers in shelters and soup kitchens about the dietary needs of persons with cardiovascular disease and how to prepare healthy meals inexpensively, increase dietary fiber, and reduce the amount of carbohydrates, which exacerbate metabolic syndrome. If the patient is not already receiving Food Stamps, encourage him/her to apply, to supplement shelter food.
- **Patient instruction** Use simple language and graphic illustrations to explain what high cholesterol is and how it affects the blood vessels and heart. (For examples, see MEDLINEplus, National Institutes of Health: www.nlm.nih.gov/health/public/heart/chol/liv_chol.pdf.) Provide instructions in the patient’s first language and use of an interpreter, if needed. If giving written instructions, make sure the patient can read and understand them.
- **Written materials** Be aware that some homeless individuals do not read well in English or at all, are poorly educated, have cognitive deficits secondary to comorbidities, lack corrective lenses, or may have blurred vision as a complication of hypertension and diabetes. But recognize that like other people, those who are homeless vary widely in intelligence, education, and literacy. Don’t assume that a patient can’t read or understand written information just because s/he is homeless. Provide educational materials in the first language of patients you serve, using simple terminology and large print with graphic illustrations to compensate for any visual limitations – e.g., handouts describing the DASH diet, ideas for sodium restriction, a recommended exercise program, effects of alcohol and smoking on cardiovascular health (www.nlm.nih.gov/health/public/heart/index.htm).

- **Portable information** Give patients written information that is compact and can be carried with them – e.g., a wallet-sized card specifying latest BP measurement; creatinine, blood urea nitrogen (BUN), and potassium levels; weight, cholesterol and high/low density lipoproteins.
- **Health insurance** If the patient has lost Medicaid coverage, urge him/her to keep reapplying. Urge patients with severe medical impairments to apply for Supplemental Security Income (SSI), which is linked to Medicaid in most states, and/or for Social Security Disability Insurance (SSDI), linked to Medicare after 24 months. Medicaid coverage is especially helpful when referring to a specialist, such as a diabetic educator or cardiologist.
- **Harm reduction** At every visit, reiterate the health risks of hyperlipidemia – heart attack, stroke, chronic disability. Describe in terms the patient can understand what “heart attack” and “stroke” mean and their possible outcomes (paralysis, incontinence, etc.). Use a harm reduction approach; suggest strategies to reduce or minimize the damage caused by high-risk behaviors, such as excessive use of alcohol, nicotine, or other drugs, with the ultimate goal of eliminating them. Recognize that it is not necessary to eliminate alcohol completely except in patients with alcoholic cardiomyopathy or severe liver disease; in other patients, modest alcohol consumption may actually be beneficial (≤ 2 ounces per day for men, ≤ 1 ounce per day for women).

MEDICATIONS

- **Simple regimen** Use the simplest medical regimen possible to facilitate treatment adherence – e.g., daily dosing of medications, taken at bedtime or with the evening meal. Prescribe medications that are appropriate and available to the patient, considering expense and duration of treatment. (For currently recommended treatment options, see ATP III Update 2004: www.nhlbi.nih.gov/guidelines/cholesterol/atp3upd04.pdf.) Consider using combination medications for diabetes and hyperlipidemia (Dean, 2007).
- **Statins** Clinical research indicates that “statins” (hydroxymethylglutaryl coenzyme A reductase inhibitors) may worsen health outcomes in persons with chronic transaminase elevations secondary to hepatitis B or C, and in chronic alcohol users. Use clinical judgment in prescribing statins for these patients, considering risks and benefits of using these medications. If statins are prescribed, consider continuation of treatment until LFT’s are 2–3 times normal limits barring other complications. Recognize that many of the statins are available at reduced price through large retail pharmacies. As an alternative to statins, consider using niacin (vitamin B3) as an effective and less expensive way to lower LDL cholesterol and increase HDL cholesterol. Use of bulk laxatives (psyllium) in combination with a low fat diet can also lower serum cholesterol in patients with mild to moderate hypercholesterolemia. But bulk laxatives may be difficult for homeless people to use correctly if they are unable to obtain appropriate liquid to take with them, or if their access to toilet facilities is limited. For patients with type 2 diabetes, consider prescribing metformin (500 mg bid) to help preserve pancreatic function and promote weight loss.

- **Pharmaceutical patient assistance programs** If the patient does not have prescription drug coverage and is ineligible for Medicaid or other public health insurance, consider use of pharmaceutical companies' patient assistance programs (www.needymeds.com), and/or the U.S. Department of Health and Human Services 340B Drug Pricing Program, if eligible (www.hrsa.gov/opa/), to obtain free or reduced-cost medications. Also consider using pharmaceutical discounts offered by large chain stores such as Wal-Mart, Target, or Ralphps. Use generic medications if medically warranted. Consider use of free drug samples until a continued supply of the prescribed medication is available. If possible, provide dedicated staff or volunteers to help patients apply for pharmaceutical discount programs.

ASSOCIATED PROBLEMS, COMPLICATIONS

- **Liver disease** High rates of alcoholism and hepatitis, two major causes of cirrhosis, have been reported in some homeless sub-groups, including injection drug users. High risk for liver damage may influence the choice of lipid-lowering medications. Monitoring liver function at baseline and one to three months following initiation of statin therapy is especially important for patients whose risk for liver disease is high.
- **Myopathy/ rhabdomyolysis** Monitor serum creatine kinase (CK) levels routinely only in patients at high risk for myopathy, including those with a history of alcohol/drug abuse or hepatitis. Be aware that medications including the antidepressant nefazodone and some HIV medications can also increase myopathy risk, as can uncontrolled seizures. Check CK levels in patients who complain of muscle aches, soreness or weakness (symptoms of myopathy); but recognize that muscle pain in homeless patients may also be related to exertion, trauma, and/or comorbidities, and that myopathy may exist in the absence of elevated CK.
- **Physical/cognitive limitations** Disabilities secondary to chronic illness or injury, frequently seen among homeless people, can limit their capacity to follow a plan of care. Physical impairments, lack of facilities, and unsafe living environments may limit their exercise alternatives. Cognitive deficits secondary to substance abuse, trauma, mental illness, or medication side effects may limit their understanding of the disease process and compromise adherence to treatment. Tailor the plan of care to patient needs and capacities.
- **Literacy/language limitations** Some homeless people have difficulty reading but may not volunteer this information out of embarrassment or shame. They may be illiterate or have a low literacy level in their primary language and/or in English, if it is not their native tongue. Assuming erroneously that patients can read directions on medicine bottles or appointment cards can lead to serious complications and loss to follow-up. Ask if patients have “trouble reading.” Provide an interpreter for those with limited English proficiency.

- **Multiple comorbidities** Uncontrolled cardiovascular disease and comorbidities (e.g., emphysema secondary to smoking, alcoholic cirrhosis) place homeless people at disproportionate risk for myocardial infarction, stroke, and organ damage. Recognize and address lifestyle factors and barriers to treatment and self-care that increase risk for negative health outcomes. For older patients with hyperlipidemia, metabolic syndrome, tobacco abuse, or family history of CAD, a cardiology evaluation is recommended.
- **Chemical dependencies** Be aware that substance use disorders, frequently seen in homeless patients, are medical problems that contribute to cardiovascular disease. Nicotine is the addictive drug most frequently used by homeless people. Smoking elevates blood pressure and pulse rate, contributing to heart attack and stroke. Excessive alcohol use can result in cardiomyopathy, which may lead to heart failure. Cocaine and amphetamines cause cardiac arrhythmia, acute hypertension, stroke, and heart attacks. Dietary supplements used for weight loss (ephedra, ma huang, white crosses) also have these effects. Uncontrolled withdrawal from excessive alcohol or drug use can result in rebound hypertension. Use motivational interviewing to promote readiness for concurrent treatment of substance abuse and cardiovascular disease (Morrison, 2007; Miller and Rollnick, 2002).
- **Lost, stolen medications** Living in shelters and on the street increases risk of medication loss, theft, or misuse. Consider dispensing smaller amounts of medications to improve adherence and allow for closer follow-up, recognizing the potential for lapses in adherence if obtaining prescribed medications is difficult for the patient. If public health insurance does not cover replacement of lost medications, use the 340B Drug Pricing Program or other sources of free/reduced-cost medications, if available, including free samples. Try to obtain a sample from the same drug family; help the patient understand that this is just a temporary substitute for medicine that has been lost. Federally Qualified Health Centers are sometimes able to purchase medicines that are not covered by health insurance.
- **Transience** Recognize that the mobility of homeless patients may compromise continuity of care and make good, routine management of hyperlipidemia less likely than episodic, crisis care. Use positive incentives to encourage follow-up (e.g., Subway sandwich coupons). Provide each patient with a pocket card listing latest test results, vital signs, and current medications to document medical history for the next care provider.
- **Lack of transportation** Homeless persons may be unable to return to the clinic due to lack of funds for transportation and/or disabilities that create additional barriers to use of public transportation. Provide carfare to facilitate follow-up. Assess for mobility impairment; provide required documentation to help impaired patients get a mobility pass.
- **Lack of housing and income** Lack of resources to meet basic needs, including stable housing, increases risk for morbidity and premature mortality, and complicates treatment of cardiovascular disease. Work with other members of the clinical team, including outreach

workers, to facilitate entry into permanent housing. Explore the availability of barrier-free access to rental housing that is not time-limited, with optional access to supportive services, or convalescent care for individuals with severe illness. Document the patient's medical conditions and functional status with cognizance of disability determination procedures required for SSI/SSDI, which provide cash assistance that can be used to help with rental payments. Recognize that permanent housing can alleviate many of the associated problems listed above.

FOLLOW-UP

- **Outreach, case management** Work with case managers and outreach workers to facilitate treatment adherence and follow-up care, including referrals to other facilities. Provide outreach to homeless shelters; invite residents to obtain needed screenings in clinic settings; offer a meal and transportation back to the shelter as incentives.
- **Frequency** More frequent (weekly/ biweekly/monthly) visits are warranted for homeless patients to increase rapport, monitor associated problems (such as elevated LFTs), reinforce understanding of the plan of care, and identify/promptly address complications of treatment or problems with adherence. Some homeless patients are more likely than others to develop complications due to poor general health and alcohol/drug use.
- **LFTs** Monitor liver function regularly after statins are begun.
- **Contact information** Verify contact information at every visit. Ask where the patient is staying (shelter, street, other locations where s/he usually sleeps or obtains meals) and how s/he can be contacted (phone/cell numbers, e-mail address). Request the address/phone number of a family member, friend, or case manager with a stable address to contact in an emergency. Provide information about how to sign up for Community Voice Mail, if available.

All recommendations for the treatment of homeless patients with hyperlipidemia presuppose use of the Model of Care described on pages 32 and 33 of this document.

CASE STUDY: HOMELESS MAN WITH HEART FAILURE

Presentation: J.M. is a 64-year-old, obese, Hispanic male referred to clinic for "painful swollen ankles." He reports his "sore legs" and "hard breathing" make it difficult to walk very far, admits he is tired after one block. He sleeps in a park, and often gets up at night to urinate. He admits he is sometimes not able to make it to the bathroom, which is on the other side of the park.

Review of systems: In addition to symptoms above, admits to fatigue. Denies chest pain, orthopnea, paroxysmal nocturnal dyspnea, polydipsia or polyphagia.

Medical history: J.M. has a history of high blood pressure, but has not taken medication consistently. He has visited 3 different emergency rooms in the last 2 months for "asthma" and was hospitalized once for "about a week." He does not have a primary care provider, stating that he goes to the emergency room when he "can't take it anymore." He reports one other hospitalization, 10 years ago, after having "heart trouble." His medication bottles are from multiple providers, with multiple medications in one bottle and empty bottles elsewhere. He denies history of diabetes and is not sure about his cholesterol; unsure of any family history.

Mental health/substance use history: J.M. has a history of schizophrenia for which he does not take medication. He smokes one pack of cigarettes per day. He denies drugs, but admits to binge drinking, with 1-2 month periods of abstinence between binges.

Physical Exam: Patient is disheveled, appears older than stated age. Blood pressure 170/94; respiratory rate 22-24; pulse ox 96%, pulse 90 and regular; temperature 98.6; weight 262 lb, height 5' 7", BMI 41. Pertinent positives on PE: dry cough, distended jugular veins, rales on auscultation, laterally displaced apical impulse with an S3 gallop, hepatomegaly, protuberant abdomen, lower extremity edema (+2) to knees.

Diagnostic Tests: urine dipstick, complete blood count (CBC), thyroid test (TSH) and cholesterol panel all normal, HIV negative. The complete metabolic panel (CMP) showed nonfasting glucose 212 (elevated), but was otherwise normal (including normal renal and liver function). EKG consistent with combined ventricular hypertrophy, right and left.

Assessment: Heart failure (clinical findings consistent with left and right-sided heart failure); hypertension; obesity; untreated schizophrenia; nicotine dependence; alcohol dependence, binge pattern; elevated glucose – rule out diabetes.

Plan of Care: Prescribe furosemide and lisinopril once daily to simplify adherence; advise to take diuretic early in the morning to avoid nighttime urination. Local homeless day center identified where patient can have access to bathroom. Shelter bed located and a note was written to shelter staff requesting bed close to bathroom. Patient advised to sit on a chair/bench with legs elevated, when possible. Referrals for alcohol treatment and mental health evaluation offered, but patient declined. Encouraged return to clinic for frequent follow-up, using positive incentives (e.g., food, socks, transportation assistance). Follow-up plan: monitor electrolytes and renal function, continue evaluation for diabetes. Arrange for chest x-ray, echocardiogram. Support treatment adherence and educate patient about his condition and healthy lifestyle modifications, including tobacco cessation. At every visit, ask about alcohol use and offer support from onsite case manager/addiction counselor.

Mark Rabiner, MD, Saint Vincents Catholic Medical Centers, Saint Vincents Manhattan, New York, New York, 2003

Heart Failure in Homeless Adults

Diagnosis and Evaluation

HISTORY

- **Living conditions** Ask patients where they are living and where they eat their meals. Ask where they slept last night and whether this is the place where they usually live,
- **Medical history** Ask specific questions about prior heart or lung disease (e.g., “Have you ever had a heart attack?”), which may give clues to the etiology of heart failure. Be aware that substance users may be reluctant to relate medical history if they have been told they have cardiomyopathy related to drug or alcohol use. Ask about other cardiac risk factors (hypertension, diabetes, lipids, etc.), symptoms (angina, dizziness, syncope, palpitations), as well as usual and current exercise tolerance – all of which are relevant to the diagnosis and classification of heart failure (See: 2009 ACCF/AHA Practice Guideline: <http://content.onlinejacc.org/cgi/content/full/53/15/e1#SEC7>). Inquire about current medications.
- **Alcohol/drug use** Assess for use of drugs that may affect the heart, such as cocaine, amphetamine, and alcohol. Recognize that use of alcohol and/or cocaine may lead to cardiomyopathy, a known cause of heart failure; injection drug use may predispose to infections of the heart valve and other structures, which may eventually present as heart failure.

PHYSICAL EXAMINATION

- **Heart /chest** Perform a thorough cardiac exam. Check for PMI, heave, barrel chesting. Palpate radial pulses for bounding.
- **Lungs** Although rales are the traditional sign of heart failure, recognize that wheezes or rhonchi may be the overt physical finding in patients with chronic obstructive pulmonary disease (COPD) and heart failure. Homeless people are more likely to have concomitant COPD from smoking. Take all the time you need to perform a thorough cardiopulmonary exam.
- **Abdomen/ Liver** Hepatic congestion in right-sided heart failure may be difficult to differentiate from hepatomegaly due to underlying liver disease. Look for fluid waves.

- **Lower extremities** Examine with shoes removed. Recognize that dependent edema is extremely common in homeless persons, and not necessarily related to heart failure. Differentiate swelling due to heart failure from dependent edema secondary to sleeping upright on park benches, sitting in chairs, or excessive walking. Pitting vs. non-pitting edema.
- **Weight** Weigh homeless patients at every visit, and record their weight on a pocket card that they can carry with them.

DIAGNOSTIC TESTS

- **Baseline CXR & EKG** Despite their low sensitivity and specificity, chest X-rays and electrocardiograms are recommended tests for the initial evaluation of all patients suspected of having heart failure. Pay attention to cardiomegaly, prior myocardial infarctions (MI), left ventricular hypertrophy (LVH), and cardiac arrhythmia. EKGs may be difficult to interpret because of the lack of prior tracing for comparison in this highly mobile population.
- **Echocardiogram** Obtain an echocardiogram. A stress test is often indicated to assess for coronary artery disease. For patients who cannot tolerate an exercise stress test, the cardiologist may choose to order a chemical stress test. Establish a good working relationship with a local public health facility or private cardiologist who can advise you on these matters. The specialist may also want to order a C-Reactive Protein and BNP-Brain Natriuretic Peptide.
- **Test results** Make it easy for the patient to get test results. Use case managers and outreach workers to facilitate return to the clinic for results and further treatment. Use Community Voice Mail (www.cvm.org), if available, to report test results, leave instructions for follow-up, or record appointment reminders.

Plan and Management

PLAN OF CARE

- **Underlying disease management goals** Try to determine the etiology of heart failure (e.g., alcohol/drug-related, HIV, CAD, hypertension, right-sided heart failure secondary to lung disease/smoking) in order to design the most effective plan of care. Homeless people often have several underlying disease processes that contribute to stresses on the heart.
- **Adherence** At the end of every visit, discuss the plan of care with the patient; ask if anything about it is unclear or difficult, and work with him/her to address obstacles to adherence.

EDUCATION, SELF-MANAGEMENT

- **Self-management goals** Work with the patient to develop self-management goals appropriate to the etiology of heart failure. Ask the patient what s/he would like to work on. Set goals in collaboration with the patient and offer an incentive (e.g., food or coupons) at the next follow-up if improvement is noted.
- **Diet/nutrition** Teach the patient how to restrict dietary sodium to as close to 2 grams per day as possible; remind him/her not to add salt to foods and to eliminate foods with high sodium content, such as potato chips and salt-cured meats. Advocate for more nutritious food choices in shelters and soup kitchens. Refer the patient to a nutritionist, preferably on the clinical team, who is familiar with the limited food choices that homeless people typically have. If the patient is not receiving Food Stamps, encourage him/her to apply, to help supplement shelter food.
- **Fluids** Some patients may need fluid restriction. It helps to express amounts in terms the patient can understand: use the patient's own water bottle and specify how many full bottles to drink each day. Understand that individuals who are mainly outdoors may need more liberal amounts of fluids during hot weather.
- **Weight measuring** Teach patients how to check their weight properly, and explain the implications of weight gain along with worsening symptoms. Allow patients to check their weight in the clinic without excessive waits.
- **Substance use** Explain that use of alcohol and other addictive drugs can cause further damage to the heart. Stress the importance of reducing/eliminating tobacco use – both smoking and chewing – and explain why. Use motivational interviewing to promote readiness for substance use treatment/therapy (Morrison, 2007; Miller and Rollnick, 2002), and help the patient obtain treatment when ready. Compile a list of referral resources to facilitate access when the patient is highly motivated to seek treatment.

- **Patient instruction** Use simple language; ask the patient to repeat instructions to ensure understanding. Give written handouts when available.
- **Written materials** Be aware that some homeless individuals do not read well in English or at all, are poorly educated, have cognitive deficits secondary to comorbidities, or lack corrective lenses. But recognize that, like other people, those who are homeless vary widely in intelligence, education, and literacy. Don't assume that a patient can't read or understand written information just because s/he is homeless. Provide educational materials in the patient's first language; use simple terminology and large print with graphic illustrations to compensate for any visual limitations – e.g., describing the DASH diet, ideas for sodium restriction, a recommended exercise program, and effects of alcohol and smoking on cardiovascular health (www.nhlbi.nih.gov/health/public/heart/index.htm).

MEDICATIONS

- **Simple regimen** Current medication recommendations are outlined in the ACC/AHA Stages of Heart Failure (<http://content.onlinejacc.org/cgi/content/full/53/15/e1/TBL3>). This staging system emphasizes the progressive course of heart failure. Choosing the appropriate medications must also take into account the individual patient's situation. Cardioprotective beta-blockers such as Carvedilol or Metoprolol are often prescribed to decrease the work of the heart muscle. Use the simplest medical regimen possible to facilitate treatment adherence. Use whatever medications are appropriate and available to the patient, considering medication expense, side effects, and duration of treatment.
- **Diuretics** Even though diuretics are standard treatment for heart failure, they can be difficult for homeless persons with limited access to bathrooms. Use alternative medications as appropriate. Be aware that diuretics can exacerbate dehydration, particularly in warmer climates. Also be aware that for patients taking medications with anticholinergic effects (especially persons with mental health problems taking older medications like phenothiazines), adding a diuretic increases the risk of hyperpyrexia and dehydration. Dangerous (even fatal) levels of hyperpyrexia can be triggered by anticholinergic medications in combination with diuretics in hot, humid environments. Work with service providers in your community to assure that homeless people have easy access to potable water and restrooms.
- **Medication boxes** Since once-a-day dosing of medications may not be possible, use pre-filled medication boxes with medication dosage slots that can be removed and carried for the day, to facilitate treatment adherence.
- **Immunizations** Provide immunizations against influenza annually and pneumococcal disease according to standard clinical guidelines.

- **Pharmaceutical patient assistance programs** If the patient does not have prescription drug coverage and is ineligible for Medicaid or other public health insurance, consider use of pharmaceutical companies' patient assistance programs (www.needymeds.com), and/or the U.S. Department of Health and Human Services 340B Drug Pricing Program, if eligible (<http://bphc.hrsa.gov/opa/>), to obtain free or reduced cost medications. Consider using discount pharmaceutical programs offered by large retail chains (such as Wal-Mart, Target, and Ralphs). If medically appropriate, authorize use of generic medications to reduce cost. Consider use of free medication samples until a continued supply of prescribed medication is available. If possible, provide dedicated staff or volunteers to help patients apply for pharmaceutical discount programs.

ASSOCIATED PROBLEMS, COMPLICATIONS

- **Medication toxicity** Check medications prescribed elsewhere that may exacerbate heart failure – e.g., nonsteroidal anti-inflammatory drugs (NSAIDs), cyclooxygenase-2 inhibitors, calcium channel blockers (especially diltiazem and verapamil), diabetes medications such as metformin or thiazolidinediones.
- **Edema** It is not unusual for homeless people to be literally on their feet all day or sleep sitting up when a bed is not readily available, resulting in dependent edema that may mask or exacerbate swelling of the lower extremities secondary to heart failure. If the patient has no place to elevate his/her feet during the day, recommend sitting on the ground to decrease swelling. For patients with edema living in their car, suggest lying down on the seat with their legs elevated on the back of the seat.
- **Orthopnea** Patients with heart failure often have difficulty breathing while lying down, which improves upon sitting or standing (orthopnea). In shelters that don't have pillows, they may opt to sleep sitting up. If pillows are not already available, provide them; educate shelter providers about the patient's need to sleep with the head slightly elevated.
- **Physical/cognitive limitations** Disabilities secondary to chronic illness or injury, frequently seen in homeless patients, can limit their capacity to follow a plan of care. Cognitive deficits secondary to substance abuse, trauma, mental illness or medication side effects may limit their understanding of the disease process and compromise adherence to treatment. Tailor the plan of care to patient needs and capacities.
- **Literacy/language limitations** A number of homeless people have difficulty reading but may not volunteer this information out of embarrassment or shame. They may be illiterate or have a low literacy level in their primary language and/or in English, if it is not their native tongue. Assuming erroneously that the patient can read directions on medicine bottles or an appointment card can lead to serious complications and loss to follow-up. Ask if the patient has "trouble reading." Provide an interpreter for patients with limited English proficiency.

- **Multiple comorbidities** Homeless people have higher rates of hypertension and high cholesterol than the general adult population, often with poor control, which may lead to cardiovascular disease. This puts them at risk for myocardial infarction, stroke, and organ damage. Homeless persons often have multiple comorbid conditions, such as emphysema secondary to smoking, cirrhosis of the liver as a result of alcoholism, hepatitis, diabetes, HIV, and/or psychiatric disorders. Recognize and address lifestyle factors and barriers to treatment and self-care that increase the patient's risk for negative health outcomes.
- **Chemical dependencies** Be aware that substance use disorders, frequently seen in homeless patients, may contribute to cardiovascular disease. Nicotine is the addictive drug most frequently used by homeless people. Smoking elevates blood pressure and pulse rate, contributing to heart attack and stroke. Excessive alcohol use can result in cardiomyopathy, which may lead to heart failure. Cocaine and amphetamines cause cardiac arrhythmia, acute hypertension, stroke, and heart attacks. Dietary supplements used for weight loss (ephedra, ma huang, white crosses) also have these effects. Uncontrolled withdrawal from excessive alcohol or drug use can result in rebound hypertension. Use motivational interviewing to promote readiness for concurrent treatment of substance use and cardiovascular disease (Morrison, 2007; Miller and Rollnick, 2002). Keep a list of referral resources ready to help the patient obtain treatment when his/her motivation is highest.
- **Lost, stolen medications** Living in shelters and on the street increases risk of medication loss, theft, or misuse. Consider dispensing smaller amounts of medications to improve adherence and allow for closer follow-up, recognizing the potential for lapses in adherence if obtaining prescribed medications is difficult for the patient. Loss of medication can be a problem when public health insurance does not allow for replacement; use 340B Drug Pricing Program or other source of free/reduced-cost medications. Federally Qualified Health Centers are sometimes able to purchase medicines that are not covered by health insurance.
- **Transience** Recognize that the mobility of homeless people can compromise continuity of care and make routine monitoring and management of heart failure less likely than episodic, crisis care. Use positive incentives to encourage follow-up (e.g., food or coupons); network with local food vendors willing to reduce their rates to help homeless individuals. Provide each patient with a pocket card listing latest test results, vital signs, and current medications to document medical history for the next care provider.
- **Lack of transportation** Homeless persons may be unable to return to the clinic due to lack of funds for transportation and/or disabilities that create additional barriers to use of public transportation. Provide bus tokens, taxi vouchers, etc. to facilitate follow-up; network with transportation authorities to inquire about purchase of discounted transportation passes. Provide required documentation to help impaired patients get a mobility pass.

- **Lifestyle limitations** Many homeless persons have limited food choices, often eating at shelters, soup kitchens or mobile food vans. Explain how to make healthier choices where the patient obtains food. Physical impairments, lack of facilities, inappropriate footwear, and unsafe living environments may limit exercise options. Discuss feasible exercise alternatives.
- **Lack of housing and income** Lack of resources to meet basic needs, including stable housing, increases risk for morbidity and premature mortality, and complicates treatment of cardiovascular disease. Establish relationships with members of the clinical team, including outreach workers, to facilitate entry into permanent housing, which will alleviate many of these associated problems. Explore availability of housing first models (featuring barrier-free access to rental housing that is not time-limited, with optional access to supportive services) or medical respite (convalescent) care for individuals with severe illness. Document the patient's medical conditions and functional status with cognizance of disability determination procedures required for SSI/SSDI, which provide cash assistance that can be used to help with rental payments.

FOLLOW-UP

- **Outreach, case management** Work with case managers and outreach workers to facilitate treatment adherence and follow-up care that may include referrals to other facilities. Provide outreach to homeless shelters; invite residents to obtain needed screenings in clinic settings; offer a meal and transportation back to the shelter as incentives. Always have a card with the clinic location, phone and hours of operation available to give to patients. Follow-up is key to chronic disease management and to the social medicine aspects of homeless health care. Find creative ways to make your patients want to follow-up with you.
- **Frequency** Consider more frequent (weekly/biweekly/monthly) follow-up visits to monitor weight, possible complications, and treatment adherence. Swollen feet and fluid in the lungs may indicate that the patient is not taking medications regularly. Keep lines of communication open and encourage regular follow-up, even if the patient does not adhere to the plan of care. Provide positive incentives to return to the clinic (food, coupons, socks, foot soaks, “priority passes” to assure prompt evaluation by a health care provider).
- **Contact information** Verify contact information at every visit. Ask where the patient is staying (shelter, street or other locations where s/he usually sleeps or obtains meals) and how to contact (phone/cell numbers, e-mail address). Request the address/ phone number of a family member, friend, or case manager with a stable address to contact in an emergency. Provide information about how to sign up for Community Voice Mail, if available.

All recommendations for the treatment of homeless patients with heart failure presuppose use of the Model of Care described on pages 32 and 33.

Model of Care

OUTREACH AND ENGAGEMENT

- **Outreach sites** Conduct outreach on the streets, in soup kitchens, in shelters and other places where homeless people receive services. Teach non-medical staff to measure blood pressure at outreach sites. Educate outreach workers to look for swelling of lower extremities and encourage persons with edema to seek care. Instruct regarding proper cuff sizes, arm positioning. Reliable portable electric BP measurement equipment can be transported to outreach shelters. Remember to calibrate frequently. Monitor non-medical staff until you feel comfortable with their skills. Teaching vital signs measurement to non-medical personnel can be very useful. Educate outreach workers to look for swelling of lower extremities and encourage persons with edema to elevate legs whenever possible and to seek further medical care. Consider providing written notes to shelters requesting leg elevation privileges for persons with edema.
- **Clinical team** Include both medical and social service providers on the clinical team. Hire staff proficient in languages used by the populations you serve. Use outreach workers and case managers to promote initial engagement with the patient. Involvement of all team members – outreach workers, case managers, medical providers, mental health professionals, substance abuse counselors, and a nutritionist – in care planning and coordination is important to facilitate engagement, diagnosis, treatment, and follow-up of persons experiencing homelessness. Consider training clients as health promoters; help highly motivated individuals find a Medical Assistant course.
- **Nonjudgmental care** Nonjudgmental and supportive patient interactions with members of the clinical team are essential for successful engagement in a trusting therapeutic relationship, which is instrumental in motivating adherence to the plan of care. Work with the patient to meet basic human needs including food, clothing, and shelter.
- **Incentives** Offer incentives to promote engagement – e.g., food and drink (or vouchers for same), hygiene products (toothpaste, brushes, socks), subway/bus cards or tokens. If possible, provide hygiene supplies, such as hotel soaps and toiletries (body wash, shampoo, lotion).
- **Patient privacy** Bring homeless patients to examining rooms as soon as possible. Be sensitive to self-consciousness about poor hygiene, over which people experiencing homelessness may have little control. Recognize that many homeless individuals have experienced interpersonal violence and/or sexual abuse, and may not feel safe waiting for extended periods in public settings. Differentiate patients who are experiencing emotional problems from those who simply don't have access to showers, and provide appropriate interventions accordingly.

SERVICE DELIVERY DESIGN

- **Standard of care** Health care providers are challenged to provide the same, evidence-based standard of care to patients who are homeless as to those who have more resources. Although meeting desired outcomes can be more challenging with homeless patients, elimination of health disparities between these patients and the general population should be a clinical goal.
- **Multiple sites** Provide primary care at multiple points of service (e.g., clinics, drop-in centers, outreach sites), as feasible. Offer blood pressure checks at all sites where homeless individuals receive services. Have a scale available for patients to weigh themselves. Consider using electronic medical records, if feasible, to promote continuity of care among multiple service sites.
- **Integrated, interdisciplinary services** Coordinate medical and psychosocial services across multiple disciplines and delivery systems, including provision of food, housing and transportation to service sites. Optimally, medical and psychosocial services should be easily accessible at the same location; fragmented service systems do not work well for homeless people. Resolution of the patient's homelessness is prerequisite to resolution of numerous health problems, and should be a central goal of the health care team.
- **Flexible clinic schedules** Appointments are frequently missed by homeless patients. Provide walk-in clinics or designated slots for walk-in patients at every primary care clinic, so that appointments aren't necessary. Designate one or two walk-in providers during each clinic session to see new patients or returning patients who may have missed a primary care appointment. Allow patients to check their blood pressure in the clinic on a walk-in basis; those with elevated blood pressure should always be seen by a provider.
- **Early appointments** Allow homeless patients easy access to early clinic appointments, especially if they are fasting. (Some soup kitchens serve meals early; requiring homeless patients to fast may prevent them from getting something to eat until many hours later.) Offer healthy snacks in the clinic to make it easier for homeless patients to agree to fast before diagnostic tests are done.
- **Hygiene** Provide shower facilities at clinics and personal hygiene kits, where possible.

For more information about clinical practices that respond to the needs of homeless patients, see: McMurray-Avila, 1998 and other sets of adapted clinical guidelines developed by the Health Care for the Homeless Clinicians' Network, available at: www.nhchc.org/practiceadaptations.html.

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WEBSITES

American Heart Association	www.americanheart.org/
American Society of Hypertension	www.ash-us.org/
Centers for Disease Control and Prevention Heart Disease	www.cdc.gov/HeartDisease/
HRSA Health Disparities Collaboratives Cardiovascular Disease	www.healthdisparities.net/hdc/html/collaboratives.topics.cvd.aspx
National Heart, Lung, and Blood Institute Heart and Vascular Diseases	www.nhlbi.nih.gov/health/public/heart/index.htm
National Health Care for the Homeless Council Cardiovascular Disease Resources	www.nhchc.org/cvd.html
U.S. Preventive Health Task Force	www.ahrq.gov/CLINIC/uspstfix.htm
World Health Organization Cardiovascular Disease	www.who.int/topics/cardiovascular_diseases/en/

ABOUT THE HCH CLINICIANS' NETWORK

Founded in 1994, the Health Care for the Homeless Clinicians' Network is a national membership association that unites care providers from many disciplines who are committed to improving the health and quality of life of homeless people. The Network is engaged in a broad range of activities including publications, training, research and peer support. The Network is operated by the National Health Care for the Homeless Council, and our efforts are supported by the Health Resources and Services Administration, the Substance Abuse and Mental Health Services Administration, and member dues. The Network is governed by a Steering Committee representing diverse community and professional interests.

To become a member or order Network materials, call 615 226-2292 or write to council@nhhc.org. Please visit our website at www.nhhc.org.