

PHILIPS

NATIONAL CHRONIC DISEASE EXPERT DESIGN PROJECT

Bringing together a national panel of medical experts in chronic disease and leaders in home health care, with the objective to develop telehealth clinical protocols and best practices in care for the four leading chronic conditions.

SPONSORED BY: **PHILIPS TELEHEALTH SOLUTIONS**

Co-sponsored by

**National Association for Home Care & Hospice
DMAA: The Care Continuum Alliance
Fazzi Associates, Inc.**

**FINAL REPORT
MARCH 2009**



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Fazzi
ASSOCIATES

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Executive Summary

Background

The home care industry faces a significant challenge. With nearly 10,000 certified agencies, 4,500 hospice agencies, and countless private duty agencies serving over four million seniors each year, nearly every agency faces the same clinical challenge - how to successfully (from a quality and financial perspective) deal with their most difficult patients, those with chronic disease.

The numbers and financial implications are staggering. Johns Hopkins University reported that over 90% of Americans over the age of 65 have one or more chronic diseases, 70% have two or more. When you couple this fact with a May 2008 Agency for Healthcare and Quality Report (*Health Care Expenses for Adults with Chronic Conditions, 2005*) that found that those with one or more chronic conditions accounted for the overwhelming majority of total medical expenses for all conditions, 95.8% for the near elderly (ages 55–64), and 98.8% for the elderly age 65 and over, the significance of these numbers become clear.

They represent 2.8 billion dollars in direct home care costs and double to triple that figure when co-morbidities are included. These patient cases traditionally lead to the greatest number of re-hospitalizations and emergent care visits. For the certified agencies, they have the most negative effect on quality outcomes and have serious implications to the financial viability of home care agencies given CMS's potential Pay for Performance initiatives. The question that everyone is asking, "Is there a more effective way to better serve patients dealing with chronic illness?"

The Potential of Telehealth

The option that has generated the greatest interest is telehealth. Since its inception, telehealth has been seen as having the potential to impact the delivery of chronic disease services in home care. Unfortunately, there have been few studies that have explored the impact of telehealth on both quality outcomes and profitability in home care.

The 2007 Philips National Study on the Future of Technology and Telehealth in Home Care did, however, generate some valuable insights and one very critical question. Over 89% of the agencies that used telehealth services (approximately 21% of all home care agencies with Medicare budgets in excess of one million dollars have telehealth services) reported that telehealth led to an increase in overall quality, while 42.8% reported that it led to a reduction in costs.

Although self-reported, it was clear that a significant number of agency directors felt that telehealth led to better quality and financial outcomes. What wasn't clear or explored in the initial study was the obvious question: *“What were the proven and best home care telehealth clinical protocols and practices for optimally (financially and quality-wise) serving home care patients experiencing one or more of the four major chronic diseases most often addressed by home care agencies: HF, COPD, hypertension, and diabetes?”* The need to answer this question is imperative and was the catalyst that led to this new effort, the Philips National Chronic Disease and Telehealth Expert Design Project.

A National Chronic Disease Expert Design Project

In response to these questions and realities, Philips Telehealth Solutions, part of Philips Healthcare, a division of Royal Philips Electronics of the Netherlands, initiated the National Chronic Disease Expert Design Project. The Project began in January 2008 and was completed in October 2008 with the additional study and refinement on the specific protocols finalized in March 2009.

In October 2008, the Philips National Chronic Disease Project brought together four nationally recognized chronic disease medical experts (one for each of the four major chronic diseases) and grouped them with home care telehealth/chronic disease practitioners from throughout the country in order to complete Phase Two of the project.

Together, this National Expert Panel reviewed the medical realities of those with the chronic diseases of CHF, COPD, diabetes, and hypertension. They reviewed all available telehealth protocol from national groups such as AHRQ, the QIOs, etc. and the proven experience and protocols developed by participating agencies who have demonstrated success in using telehealth with one or more of these patient populations. Based on these insights, the National Expert Panel went through a systematic exercise designed to collectively develop the best practice parameters and protocol for addressing each of the four major chronic diseases.

Panel Findings

The National Expert Panel was able to generate specific expected outcomes and service guidelines for the four chronic diseases assessed. In each case, monitoring/telehealth parameters were established as well as the focus of patient education, number of visits, and follow-up needed for these disease states. The results are a blueprint for home care agencies to follow to achieve improved outcomes incorporating monitoring/telehealth with specific visit frequency and telephone assessments for patients with HF, diabetes, hypertension, and COPD. The use of monitoring/telehealth was a key component in managing the patients' conditions at home, ultimately improving outcomes including reducing re-hospitalizations and emergent care.

What is Heart Failure?

Heart failure, (HF) is a condition where the heart cannot pump enough blood and oxygen to meet the needs of other body organs. HF refers to congestion or fluid in the lungs due to HF. HF is not a disease but a syndrome that can be caused by many different diseases. In some individuals, the squeeze of the heart muscle is reduced; a condition referred to as Systolic HF. In others, the problem is that the muscle is stiff and blood backs up in the lungs, (diastolic HF). Like most chronic diseases there is no cure for heart failure. There are good treatments to retard the progression. Occasionally with these treatments the condition can reverse itself, but this is dependent on the original insult that caused the heart failure. Once diagnosed, medicines are needed for the rest of the person's life. Occasionally, if these do not work some people are treated with a heart transplant or mechanical pump.

Heart failure is the leading reason people over 65 are hospitalized. There are over 1,000,000 HF admissions each year. The disease is more common with advancing age and with the aging of the US population it is estimated the number of HF cases will double by 2030. In addition, as people survive their heart attacks and arrhythmias, more remain alive to eventually suffer the ills of HF.

The most common cause for HF is ischemia or blocked arteries and heart attack; but other conditions like viral infections, pregnancy, toxins, and congenital causes are not uncommon. Despite treatment, patients hospitalized with the HF syndrome have a survival rate of 50% over the next 5 years, worse than most cancers.

Symptoms

- Fatigue is the most common symptom. Often this is insidious in onset so people think they are just older or out of shape. This progresses until they realize they are so limited even activities of daily living are a challenge.
- Shortness of breath is the second most common symptom, usually associated with reduced ability to exercise or walk. Sometimes the symptoms get worse at night when the person lies down.
- Weight gain with swelling in the legs, ankles, or lower back from fluid buildup in the body.
- Breaking out in a cold sweat, nausea, lightheadedness, general tiredness and weakness.

Treatment for HF usually involves three or four medicines; ACE inhibitors, diuretics, digoxin, and beta blockers. Early diagnosis and treatment can improve the quality of life and life expectancy of persons with heart failure, including:

- Reducing their dietary intake of salt (sodium).
- Taking prescribed medications as recommended each day.
- Getting daily physical activity as recommended by their health provider.
- Being aware of and telling their health provider about their heart failure symptoms.
- Taking and keeping track of their weight every day to check fluid buildup in the body and telling their health provider of changes in weight over a short time.
- Learning ways to deal with depression and stress and get treatment if needed.

Telehealth equipment in a patient's home can be used to measure blood pressure, oxygen saturation, heart rate, and to monitor weight.

Sources:

Centers for Disease Control and Prevention, Division for Heart Disease and Stroke Prevention, Announcements, February is American Heart Month

Centers for Disease Control and Prevention, Division for Heart Disease and Stroke Prevention, Heart Failure Fact Sheet

University of Michigan Health System, Department of Public Relations and Marketing Communications, Newsroom, Congestive heart failure leads to greater disability and nursing home admissions among older adults, January 7, 2008

HF Service Guidelines

In order to achieve improved self-management by patients with HF resulting in no avoidable re-hospitalizations or emergent care visits, as well as improvements in ADL's as measured by OASIS, the following service guidelines are recommended for HF patients* referred to home care:

Visits

- Schedule 7-11 skilled nursing visits.
- Front load visits in the first two weeks.
- Visit or telephone assessment completed weekly.
- Add visits if warranted after telephone assessments.
- Schedule an additional two PRN visits if patients experience either shortness of breath or a weight gain of 5 lbs. or more.

Telehealth

- Telehealth equipment demonstrations and set-up may be conducted by a non clinical person such as a home health aide.
- Incorporate telehealth seven days per week by establishing patient parameters including weight ranges (not more than 2 lbs in a day), oxygen saturation levels and blood pressure baselines.
- Question the patient on medical and nutritional compliance, edema, or abdominal bloating, dyspnea, signs of depression, and fatigue.

Patient Education

- Focus patient education on the disease process, who to call if symptoms worsen, medication regime, nutrition, activity, and discharge goals.
- Develop medication protocols for prompt intervention.

*Patients not appropriate for the HF Service Guidelines include patients without a physician order, patients without the ability to access data, patients and/or caregivers with physical and/or cognitive impairment, patients with extremely poor home conditions and those patients with Stage IV Heart Failure (consider palliative care).

Expert Panel Recommendations - HF

Inclusion/Exclusion	Focus of Monitoring/Telehealth Parameters	Patient Education Focus	Expected Outcomes	Service Guidelines
<p><u>Inclusion</u></p> <ul style="list-style-type: none"> • HF patients referred to home health <p><u>Exclusion</u></p> <ul style="list-style-type: none"> • No Physician order • No ability to access to data • Physical and/or cognitive limits of patient and caregiver • Home condition extremely poor • Stage IV Heart Failure (consider palliative care) 	<p><u>Establish patient parameter</u></p> <ul style="list-style-type: none"> • Weight ranges: <ul style="list-style-type: none"> • ↑ 2 lbs/day • ↑ 5 lbs within 5-7 days • SPO₂ • BP: 10-15% change from baseline • Heart rate <p><u>Questions/Query</u></p> <ul style="list-style-type: none"> • ADL's including fatigue • Dyspnea • Medical compliance • Nutrition compliance • Edema or abdominal bloating • Signs of depression 	<ul style="list-style-type: none"> • Disease process • S/S of HF, who and when to call when symptoms have worsened / experiencing an exacerbation of disease <ul style="list-style-type: none"> • Including weight log • Medication regime • Nutrition • Activity • Simplistic HF discharge goals 	<ul style="list-style-type: none"> • No avoidable re-hospitalizations • Improvement in ADL's (as measured on OASIS) • No avoidable emergent care visits <p><u>Improved self management by</u></p> <ul style="list-style-type: none"> • Improved medication compliance • Dietary restrictions • Keeping log of S/S, weight, BP • Parameters are maintained within patient ranges 	<ul style="list-style-type: none"> • Average HF patient • 7-11 skilled nursing visits • Provide telehealth to Class 2 & 3 CHF patients • Front load the 1st and 2nd weeks • Medication protocols for prompt intervention • Telemonitoring 7 days/week • Visit or telephone assessment weekly (reinforcement/correlation) • Additional home visits after telephone triage • 2 PRN visits for HF exacerbation <ul style="list-style-type: none"> • ↑ SOB • ↑ weight 5 lbs

Heart Failure Further Reading

Dunbar, Sandra B., Jacobsen, Laura H., and Deaton, Christi. Heart Failure: Strategies to Enhance Patient Self-Management. *Advanced Practice in Acute & Critical Care*, 9 (2): 244-255, May 1998.

Kashem, Abdul, Cross, Robert, et al. Management of Heart Failure Patients Using Telemedicine Communication Systems. *Current Cardiology Reports, Current Medicine Group, LLC*, Vol. 8, Number 3, 171-179 May 2006.

Knox D., Mischke L. Implementing a Congestive Heart Failure Disease Management Program to Decrease Length of Stay and Cost. *Journal of Cardiovascular Nursing*, 55-74, October 1999.

Lehmann, Craig. Economic Benefits of e-Technology in Managing Congestive Heart Failure. *Center for Aging Services Technologies*, www.agingtech.org

Levine, B.A., McAlinden E., Hu, T.M. et al. Home Monitoring of Congestive Heart Failure Patients. *Distributed Diagnosis and Home Health Care*, D2H2-1st Transdisciplinary Conference, Vol., Issue, 2-4 , 33-36, April 2006.

Schneider, Nina M. Managing Congestive Heart Failure Using Home Telehealth. *Home Health Nurse*; 22:719-722, October 2004.

Seibert, Pennie S. Whitmore, Tiffany A., Patterson, Carin et al. Telemedicine Facilitates CHF Home Health Care for Those with Systolic Dysfunction. *International Journal of Telemedicine and Applications*; Vol. 2008, Article 3, January 2008.

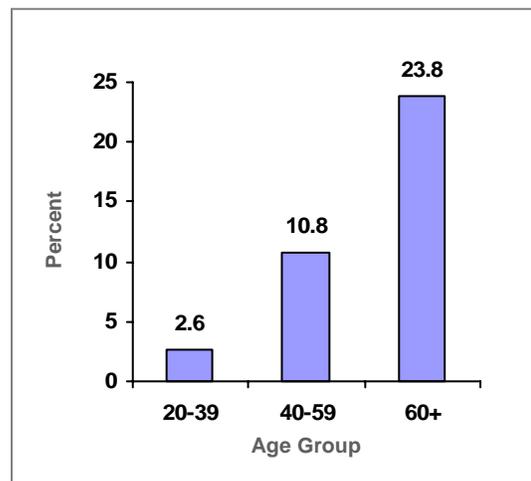
What is Diabetes?

Diabetes is a group of diseases marked by high levels of blood glucose, also called blood sugar, resulting from defects in insulin production, insulin action, or both. Diabetes can lead to blindness, kidney damage, cardiovascular disease, lower-limb amputations, and premature death. In adults, type 1 diabetes (insulin dependent) accounts for 5 to 10 percent of all diagnosed cases of diabetes, and type 2 diabetes (non-insulin dependent) accounts for about 90 to 95 percent. Pre-diabetes is a condition in which individuals have blood glucose levels higher than normal but not high enough to be classified as diabetes.

Uncontrolled diabetes will often lead to biochemical imbalances that can cause acute life-threatening events, such as diabetic ketoacidosis and hyperosmolar, or nonketotic, coma. People with diabetes are more susceptible to many other illnesses and, once they acquire these illnesses, often have worse prognoses. According to The National Diabetes Information Clearinghouse, other complications include:

- Adults with diabetes have heart disease death rates about two to four times higher than adults without diabetes.
- Diabetes is the leading cause of new cases of blindness among adults aged 20 to 74 years.
- Diabetes is the leading cause of kidney failure.
- About 60 to 70 percent of people with diabetes have mild to severe forms of nervous system damage.
- More than 60 percent of non-traumatic lower-limb amputations were performed in people with diabetes.
- Periodontal, or gum, disease is more common in people with diabetes.

According to the National Diabetes Information Clearinghouse 2007 data, nearly 24 million people in the U.S. have diabetes (including 5.7 million undiagnosed persons). The Center for Disease Control reports that an additional 54 million are estimated to have pre-diabetes. Also in 2007, an estimated 536,000 new cases of diabetes were diagnosed in people aged 60 and older. And, persons with diabetes aged 60 years or older are two to three times more likely to report an inability to walk a quarter of a mile, climb stairs, do housework, or use a mobility aid compared with persons without diabetes in the same age group.



Estimated Prevalence of diagnosed and undiagnosed diabetes in people aged 20 years or older, by age group, U.S., 2007

Source: 2004-2006 National Health Interview Survey estimates projected to year 2007

Symptoms of diabetes include frequent urination, excessive thirst, extreme hunger, unusual weight loss, increased fatigue, irritability, and blurry vision. Because these symptoms can seem so harmless, diabetes often goes undiagnosed.

Treatment for many people with type 2 diabetes includes controlling their blood glucose by following a healthy meal plan and exercise program, losing excess weight, and taking oral medication. Some people with type 2 diabetes may also need insulin to control their blood glucose. People with type 1 diabetes must have insulin delivered by injection or a pump. Oral medications may also be given, including medications to control cholesterol and blood pressure.

Self-management education or training is a key step in improving health outcomes, including diet, exercise, and monitoring blood glucose, blood pressure, and blood lipids. Appropriate therapy can reduce cardiovascular morbidity and mortality, amputation rates, progression of renal disease and blindness.

Telehealth can provide home educational and monitoring services as needed and give rapid feedback and intervention. Telehealth can be used to provide diabetes case management to patients with diabetes. In some care models, the case manager alone or in collaboration with a physician, directs the titration of diet, exercise and medications to optimize control of blood sugar, blood lipids, blood pressure and weight.

Sources:

Informatics for Diabetes Education and Telemedicine (IDEATel), Home Telemedicine for the Health Care Provider, A Practical Guide, Potential Impacts of Telemedicine on Diabetes National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), National Diabetes Information Clearinghouse, U.S. Department of Health and Human Services, NIH Publication No. 08-3892, June 2008 U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Diabetes Fact Sheet, 2007

Diabetes Service Guidelines

In order to achieve the goals of compliance with diabetes management standards of care, independence with testing, maintaining blood glucose and blood pressure levels within established targets resulting in no avoidable re-hospitalizations or emergent care visits, the following service guidelines are recommended for patient with diabetes* who have the ability to be remotely monitored:

Visits

- For stable patients
 - 8 visits plus two PRN visits
 - Front loaded
 - 3 visits in week 1, then 2 visits in week 2, then 1 visit for week 3, then every other week
 - Phone assessments as needed
- For unstable patients
 - 10 visits plus six PRN visits
 - 3 visits in week 1, then 2 visits for 2 weeks, then every other week
 - Phone assessments as needed
- Interventions for PRN visits are warranted when
 - Rise in blood glucose due to medication compliance and/or dietary compliance issues
 - Symptoms or signs of illness
 - Equipment issues
 - Skin integrity issues
 - Caregiver issues and teaching needs

Telehealth

- Telehealth equipment demonstrations and set-up may be conducted by a non clinical person such as a home health aide.
- Incorporate telehealth seven days per week by establishing patient parameters including vital signs, blood glucose levels, and weight levels.
- Establish metrics.
- Schedule PRN visits as indicated above.

Patient Education

- Focus patient education on standards of care and the target ranges.

- Cover topics such as prevention of long term complications and the benefits of good blood sugar control, diet, exercise, signs and symptoms of acute complications, sick day management, skin assessment, community resources, managing changes in the condition, and depression.

*Patients appropriate for the service guidelines are symptomatic, have elevated hemoglobin, are newly diagnosed, have new or changed medications and/or have self care deficits. Patients are excluded if they need daily visits, have cognitive deficits, lack a caregiver and/or the home environment is not conducive to monitoring.

Expert Panel Recommendations - Diabetes

Inclusion/Exclusion	Focus of Monitoring/Telehealth Parameters	Patient Education Focus	Expected Outcomes	Service Guidelines
<p><u>Inclusion</u></p> <ul style="list-style-type: none"> • Symptomatic • Elevated Hemoglobin A1C • New onset diabetics • New meds/change in meds • Ability to be remotely monitored • Self care deficits <p><u>Exclusion</u></p> <ul style="list-style-type: none"> • Daily visits, e.g. wound • Cognitive deficits • Lack of caregiver • Home environment not conducive to monitoring 	<ul style="list-style-type: none"> • Vital signs • Blood glucose • Answers to questions • Weight <p><u>Metrics</u></p> <ul style="list-style-type: none"> • Norms • Patient adjusted • Ranges to be adjusted 	<ul style="list-style-type: none"> • Standards of care – target ranges • Finances • Diet • Exercise • S/S of acute complications • Medical management • Prevention of long term complications – benefit of good control • S/S infection • Sick day management • Skin assessment • Community resources – identifying and addressing barriers • Managing change in condition • Addressing depression (coping mechanism) 	<ul style="list-style-type: none"> • Compliance w/diabetes management standards of care • Independence w/testing • Compliance w/measurements • Blood glucose within target – A1C decreasing • Blood pressure within target • No avoidable emergent care/hospitalization • Receptive to self care – participates in setting goals • Acknowledges diagnosis 	<p><u>Interventions for PRN's</u></p> <ul style="list-style-type: none"> • ↑ blood glucose <ul style="list-style-type: none"> • Medication compliance • Dietary compliance • Symptomatic/signs of illness <ul style="list-style-type: none"> • Specific interventions based on symptoms • Equipment issues • Skin integrity issues • Caregiver issues/teaching <p><u>Stable Patient</u></p> <ul style="list-style-type: none"> • 8 total plus 2 PRN's • Front loaded • 3 w x 1 then • 2 w x 1 then • 1 w x 1 then • Every other week for remainder of episode • PRN phone assessments <p><u>Unstable Patient</u></p> <ul style="list-style-type: none"> • 10 total plus 6 PRN's • 3 w x 1 then • 2 w x 2 then • Every other week • PRN phone assessments

Diabetes Further Readings

Barnett, Tracey, Chumbler, Neale et al. The Effectiveness of a Care Coordination Home Telehealth Program for Veterans with Diabetes Mellitus: A 2-Year Follow-up. *The American Journal of Managed Care*, 12(8): 467-474, August 2006.

Bowles, Kathryn, Baugh, Amy. Applying Research Evidence to Optimize Telehomecare, *Journal of Cardiovascular Nursing*, 22(1): 5-15, January/February 2007.

Blanchet, Kevin D. Telehealth and Diabetes Monitoring. *Telemedicine and e-Health*, 14(8): 744-746, October 2008.

Mirou, Jaana. Home Telemonitoring of Patients With Diabetes: A Systematic Assessment of Observed Effects. *Journal of Evaluation in Clinical Practice*, 13(2): 242-253, April 2007.

What is Hypertension (HTN)?

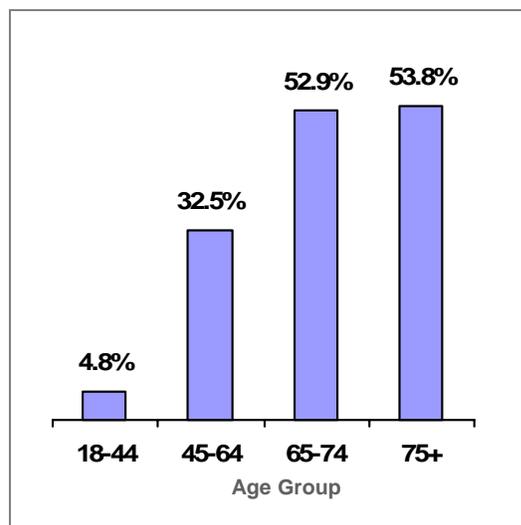
Hypertension, commonly referred to as high blood pressure, is a serious medical condition which, if not controlled, can lead to more serious cardiovascular conditions. Blood pressure is the force of blood pushing against the walls of the arteries as the heart pumps out blood. If this pressure rises and stays high over time, it can damage the body in many ways.

Hypertension, or elevated blood pressure, indicates that the heart is working harder than normal, putting both the heart and the arteries under a greater strain. This may contribute to heart attacks, strokes, heart failure, kidney failure and atherosclerosis. If high blood pressure isn't treated, the heart may have to work progressively harder to pump enough blood and oxygen to the body's organs and tissues to meet their needs.

Hypertension is the most common primary diagnosis in the U.S., accounting for over 10 million doctor visits per year, and is a major risk factor for heart disease, which is the leading cause of death in America. About 72 million (one in three) of American adults have high blood pressure. Over half of Americans age 60 and older have high blood pressure. According to a Centers for Disease Control and Prevention (CDC) survey on hypertension, the prevalence of hypertension increased with age to 67% among those aged 60 years and older.

High blood pressure itself usually has no symptoms. Rarely, headaches may occur. One-third of people with high blood pressure do not know they have the condition and will only learn that they have it after the damage has caused problems, such as coronary heart disease, stroke, or kidney failure. This is why high blood pressure is often called the "silent killer." The only way to tell if you have high blood pressure is to have your blood pressure checked. Risk for high blood pressure is increased by certain factors including age. People with normal blood pressure at age 55 have a 90% risk of developing high blood pressure as they age.

Treatment of high blood pressure for most people is life-long, as it is a disease that can be controlled but not cured. The treatment goal for most adults is to get and keep blood pressure below 140/90 mmHg. Blood pressure medicines and lifestyle changes including following a healthy eating plan, getting



Age-adjusted percentages of hypertension among persons 18 years of age and over, U.S., 2006

Source: Centers for Disease Control and Prevention, Summary Health Statistics for U.S. Adults: National Health Interview Survey, 2006

enough physical exercise, maintaining a healthy weight, quitting smoking, avoiding excessive alcohol, and managing stress can help control high blood pressure. Controlling high blood pressure is a key component of disease management programs for other chronic health conditions, lowering the risk of stroke, heart attack, heart failure, and kidney disease.

Telehealth equipment can be used at a patient's home to measure blood pressure on a regular basis. Education about hypertension and self-management techniques can also be provided through telehealth.

Sources:

American Heart Association

Pfizer Health Solutions, High Blood Pressure (Hypertension): Fact Sheet

U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, Hypertension Awareness, Treatment, and Control – Continued Disparities in Adults: United States, 2005-2006, No 3., January 2008

University of Michigan, Kellogg Eye Center

Hypertension Service Guidelines

In order to achieve the goals of a blood pressure level below the target range for two weeks, tolerance of hypertension medications, no medication changes within four weeks and self-management of needs resulting in no avoidable re-hospitalizations or emergent care visits, the following service guidelines are recommended for patients with hypertension* who have the ability to be remotely monitored:

Visits

- All patients receive 7 skilled nursing visits with 4 prn visits for telehealth findings and medication management
 - 2 visits for 2 weeks, then 1 visit for 1 week, then every other week for the remainder of the episode
 - Assess orthostatic blood pressure during all skilled nursing visits.

Telehealth

- Telehealth equipment demonstrations and set-up may be conducted by a non clinical person such as a home health aide.
- Telehealth monitoring daily of vital signs, blood glucose, and weight.
- Week 1
 - Measure blood pressure two times upon rising and two times before resting.
 - Calculate weekly mean including the 14 readings for both mornings and evenings.
- Week 6 or Discharge Planning
 - Recalculate weekly mean.

Patient Education

- Focus patient education efforts on self-monitoring and keeping a blood pressure log, the disease process, signs and symptoms, complications, reading food labels, and emergency planning. Cover medication management and medication side effects, lifestyle management including sex, exercise, stress reduction, lowering alcohol consumption, smoking cessation, and weight management.

*Patients appropriate for the service guidelines have a primary or secondary diagnosis of hypertension with one or more of the following indicators: family hypertension co-morbidities, past medical history of hypertension, new hypertension medications, changed hypertension medication and frequent blood pressure monitoring required. Patients not appropriate for the guidelines have physical/cognitive impairment, are over 90 years old, are non compliant and/or are unsafe at home.

Expert Panel Recommendations - Hypertension

Inclusion/Exclusion	Focus of Monitoring/Telehealth Parameters	Patient Education Focus	Expected Outcomes	Service Guidelines
<p><u>Inclusion</u></p> <ul style="list-style-type: none"> • Primary or secondary HTN Dx • Risk Assessment Indicators <ul style="list-style-type: none"> • (Family Hx co-morbidities) • Outpatient Dx of HTN • Past medical Hx of HTN • Hx hypertensive crisis • New HTN meds • Changed HTN meds • Compliance Hx • Frequent BP Monitoring required <p><u>Exclusion</u></p> <ul style="list-style-type: none"> • Physical/cognitive impairment caregiver • Age > 90 • Hx non-compliance • Provider/pt refusal • Home environment (technology, safety) • Non daily visits • Short term (<7d) 	<ul style="list-style-type: none"> • Frequency: <u>daily</u> monitoring • AHA Guideline: “Call to action home BP monitoring” • Symptom management/patient education <p><u>Blood pressure</u></p> <ul style="list-style-type: none"> • High: 180/110 • Target: <135/85 • DM, CKD, CAD <125/75 • Low: 90/50 <p><u>Pulse</u></p> <ul style="list-style-type: none"> • High: 100/Low: 50 <p><u>Weight</u></p> <ul style="list-style-type: none"> • If lifestyle management indicated (i.e. weight loss) • If BMI ≥ 25, establish weight loss plan <p><u>Provider notification</u></p> <ul style="list-style-type: none"> • Single (confirmed via tele-triage) reading of BP > 180/110 or < 90/50 • 7 day mean above BP Target <p><u>Use clinical pathways/questions</u></p> <ul style="list-style-type: none"> • HTN focus • Lifestyle management <p>Individualize symptom management</p>	<ul style="list-style-type: none"> • Self monitoring: BP log maintenance • Disease process • Signs & symptoms: ↑BP, ↓BP, orthostatic changes • Complications: CVA, MI • Diet “dash”: Food Labels • Telehealth equipment education • Emergency plan • Provider communication <p><u>Medication management</u></p> <ul style="list-style-type: none"> • Side effects <p><u>Lifestyle management</u></p> <ul style="list-style-type: none"> • Sex, exercise • Stress reduction • ↓ETOH • Smoking cessation • Weight management <p><u>Follow-up</u></p> <ul style="list-style-type: none"> • Medical home • Medication changes 	<ul style="list-style-type: none"> • Blood pressure below target range x 2 weeks • Tolerate HTN medications • No HTN medication changes x 4 weeks • Self-management of HTN needs/care 	<ul style="list-style-type: none"> • 4 PRN: assess telehealth findings, med management • Telehealth equipment demonstration and/or set up may be conducted by non-clinician, aka: HHA • Telehealth monitoring: daily <p><u>Week 1</u></p> <ul style="list-style-type: none"> • Measure BP 2 times upon rising/2 times upon resting • Calculate weekly mean (include 14 readings for both morning & evening) <p><u>6 week or discharge planning</u></p> <ul style="list-style-type: none"> • Recalculate weekly mean <p><u>Skilled Nursing Visits</u></p> <ul style="list-style-type: none"> • 2 w x 2 then • 1 w x 1 then • Every other week for remainder of episode <p><u>Ongoing</u></p> <ul style="list-style-type: none"> • Assess orthostatic B/P during all SN visits

Hypertension Further Readings

Bakx, J. Carel, van der Wel, Mark C., van Weel, Chris. Self Monitoring of High Blood Pressure. *British Medical Journal*, 331: 466-467, 2005.

Cheng, Cynthia, Studdiford, James S., Chambers, Christopher. Effect of Home Monitoring on Hypertension Control. *American Journal of Hypertension*, 15, 86A-86A, doi:S0895-7061(02)02507-4, 2005.

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What is Chronic Obstructive Pulmonary Disease (COPD)?

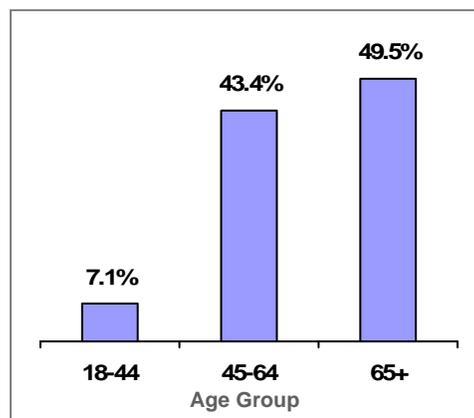
Chronic obstructive pulmonary disease (COPD) is a term referring to two lung diseases, chronic bronchitis and emphysema. Both conditions cause obstruction of airflow that interferes with normal breathing. Both frequently exist together, so physicians prefer the term COPD. This definition of COPD does not include other obstructive diseases such as asthma, although uncontrolled asthma over a lifetime can result in damage and COPD.

COPD is the fourth leading cause of death in the U.S. (In 2005 it was estimated at one death every four to five minutes.) In 2006, an estimated 9.5 million Americans were diagnosed with chronic bronchitis, including 2.2 million people over 65 years of age. Of the estimated 4.1 million Americans ever diagnosed with emphysema in their lifetime, 93 percent were 45 or older. Over the next 20 years, medical costs related to COPD will total approximately \$832.9 billion in the U.S. according to a study by the American Thoracic Society.

Symptoms of COPD are chronic cough, increased mucus, frequent clearing of the throat and shortness of breath, with more recent definitions including reduced lung function. Symptoms of emphysema include cough, shortness of breath and a limited tolerance for exercise. Signs of worsening include having more difficulty with walking and exercising, and becoming short of breath after just a little activity. Breathing tests will show severe airflow limitation. With severe COPD, complications like respiratory failure or signs of heart failure may develop. At this stage, the quality of life is greatly impaired and the worsening symptoms may be life threatening.

Treatment of COPD includes pulmonary rehabilitation, disease management training, advice on diet, counseling, oxygen therapy, and surgical interventions. Inhalant or aerosol spray medications, expectorants, and antibiotics are often used for management. Smoking cessation is the most effective intervention to slow lung function decline and help protect against COPD progression. In advanced stages, lung transplantation or lung volume reduction surgery may be helpful. COPD lung damage is irreversible and progressive, there is no cure.

To improve the quality of life of a COPD patient, telehealth equipment could measure lung function, daily COPD symptoms, oxygen levels, temperature, and include questions on exercise and other rehabilitation therapy.



Percent distribution of emphysema by age, U.S., 2006

Source: National Center for Health Statistics, National Health Interview Survey, 2006

Sources:

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COPD Service Guidelines

In order to achieve the goals of being able to verbalize an action plan for significant changes in symptoms and medication usage, as well as to demonstrate understanding of when and what to report to a health care provider and to recognize COPD symptoms of potential exacerbation, resulting in no avoidable re-hospitalizations or emergent care visits, the following service guidelines are recommended for patients with COPD* who have the ability to be remotely monitored:

Visits

- All patients receive: Skilled nursing visits two to three times in week one, one to two times in week two and as needed for six weeks.
- If the patient is recertified, five visits will be authorized as needed over nine weeks with an additional two prn visits.
- Weekly phone call as needed for metrics outside of set parameters.

Telemonitoring

- Telehealth equipment demonstrations and set-up may be conducted by a non clinical person such as a home health aide.
- Telemonitoring will track vital signs daily including pulse, weight and blood pressure, as well as use of a dyspnea scale. Symptom assessment to include sputum assessment and subjective questioning.
- Patients receive daily telemonitoring and weekly phone calls. Additional phone follow-up as needed.

Patient Education

- Focus patient education efforts on the disease process, smoking cessation, regular physician visits, and knowledge of baseline metrics. In addition, patients will learn medication management including side effects and maintenance and rescue therapies.
- Proper use of oxygen nebulizers and inhalers needs to be covered.

* Patients appropriate for the service guidelines have a high risk for re-hospitalization, have been recently discharged from the hospital with a COPD diagnosis, are new to oxygen, or have medication changes. Patients not appropriate for the guidelines have an inappropriate environment due to safety, technology or sanitary conditions, are non-compliant, do not have a doctor's order and/or have psychological or social issues.

Expert Panel Recommendations - COPD

Inclusion/Exclusion	Focus of Monitoring/Telehealth Parameters	Patient Education Focus	Expected Outcomes	Service Guidelines
<p><u>Inclusion</u></p> <ul style="list-style-type: none"> • High risk for re-hospitalization • Recent D/C from hospital with exacerbated COPD Dx <ul style="list-style-type: none"> • ER visits • Unscheduled MD visits • Medication changes (including addition of steroids over previous year) <ul style="list-style-type: none"> • New on O₂ • Newly diagnosed pending exacerbation • COPD Dx – staged by GOLD* criteria <p><u>Exclusion</u></p> <ul style="list-style-type: none"> • Inappropriate environment <ul style="list-style-type: none"> • Safety • Technology • Sanitary • PT/MD refusal • Psychological/social issues <p>*Global Initiative for Chronic Obstructive Lung Disease</p>	<p><u>Vital signs (daily & PRN – either pt or agency)</u></p> <ul style="list-style-type: none"> • Pulse oximetry • Weight • BP/HR <p><u>Dyspnea scale (daily & PRN for deviation from baseline)</u></p> <ul style="list-style-type: none"> • Industry standard <p><u>Disease Modules (symptom assessment)</u></p> <ul style="list-style-type: none"> • Sputum (amount, color change) • Subjective questions (Medical use, activity level, O₂ use) <p>*Parameters for metrics based on baseline and acted upon with progressive trending</p>	<ul style="list-style-type: none"> • Smoking cessation • Regular MD visits • Physical rehab • Knowledge of baseline metrics <p><u>Medication</u></p> <ul style="list-style-type: none"> • Maintenance therapy • Rescue therapy • Realization PRN meds no longer effective – contacts home care provider <p><u>Medication side effects</u></p> <ul style="list-style-type: none"> • Normal • Abnormal <p><u>Disease teaching</u></p> <ul style="list-style-type: none"> • Energy conservation • Diet • Vaccinations • Self management, S/S of exacerbation • Traveling with O₂/safety • Seasonal variation <p><u>Psychological/social</u></p> <ul style="list-style-type: none"> • Depression • Support • Resources <p><u>Proper use of equipment</u></p> <ul style="list-style-type: none"> • O₂/neb/inhalers • Peak flow meters 	<ul style="list-style-type: none"> • Able to verbalize action plan for significant changes in symptoms • Verbalize medication use for routine meds, PRN meds, and equipment • Demonstrates/verbalizes understanding of when/what to report to home care provider • Be able to recognize symptoms of potential exacerbation • Activity level returned to baseline • Attempt to keep patient on service for at least 2 months or 60 day period <ul style="list-style-type: none"> • Recert for med changes, increased use of PRN meds, ER visits, unscheduled MD or hospitalization. 	<ul style="list-style-type: none"> • Daily monitoring • Weekly phone calls – PRN phone calls for metrics out of parameters <p><u>Guidelines the same for all COPD patients</u></p> <ul style="list-style-type: none"> • SN 2-3x week x 1 • SN 1-2x week x 2 • SN QO week x 6 weeks • 2 PRN SN visits for exacerbation (pt specific on their symptoms) <p><u>If patient recerted</u></p> <ul style="list-style-type: none"> • SN QO week x 9 – 5 visits (2 PRN) • Daily monitoring • Weekly phone call (PRN for metrics out of parameters)

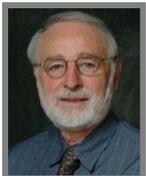
COPD Further Readings

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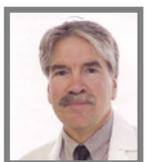
Philips National Chronic Disease Expert Design Project

Medical Experts



Dr. Phillip Corsello

Dr. Corsello is Medical Director of National Jewish Health Disease Management Programs. He is a board-certified pulmonologist with over 30 years experience in the treatment of Chronic Obstructive Pulmonary Disease (COPD). He is the Associate Medical Director of the National Jewish Health Pulmonary Rehabilitation Program (PRIDE). Dr. Corsello is a graduate of the University of Pittsburgh and completed his fellowship in pulmonary disease at the University of Colorado. He engaged in a small group private practice of pulmonary medicine, much of it critical care medicine, for nearly fifteen years prior to joining a large, capitated multi-specialty medical group in southern California in 1981. In 1985 he returned to Colorado as a faculty member at the National Jewish Health, and has thus had extensive experience in no less than three healthcare delivery systems.



Dr. Gerard Criner

Dr. Criner, Professor of Medicine, Temple University, Section of Pulmonary and Critical Care Medicine, is director of the Medical Intensive Care Unit and Ventilator Rehabilitation Unit. His clinical interests are in advanced lung disease (COPD, emphysema, pulmonary fibrosis, pulmonary hypertension, respiratory failure) and critical care medicine.



Dr. Christopher Hebert

Christopher Hebert, M.D. is a general internist and staff physician with the Cleveland Clinic Department of Nephrology and Hypertension, with a dual appointment in the Department of Quantitative Health Sciences. His interests include community hypertension, risk prediction, outcomes measurement, and increasing the value of health care services. He is a graduate of the VA National Quality Scholars Fellowship Program, and presently serves as Director of the Center for Quality Patient Care in the Glickman Urologic and Kidney Institute.



Dr. Frank Smart

Frank W. Smart, MD, is The Dorothy and Lloyd Huck Chairman of the Department of Cardiovascular Medicine at Atlantic Health and The Gagnon Heart Hospital of Morristown Memorial and Overlook Hospital, New Jersey. Dr. Smart's research interests are primarily devoted to translational and clinical heart failure and the consequences of heart failure. A sought-after speaker, he has delivered invited lectures and presentations concerning the treatment of decompensated heart failure, the management of heart failure and vasoreactivity in heart failure outpatients, mechanical support for heart failure patients, and cardiac transplantation.



Dr. Jay Skyler

Jay S. Skyler, MD, MACP is Professor of Medicine, Pediatrics, & Psychology, in the Division of Endocrinology Diabetes & Metabolism, Department of Medicine, University of Miami Leonard M. Miller School of Medicine. He is Associate Director for Academic Programs in UM's Diabetes Research Institute. He is Chairman of the NIH (NIDDK)-sponsored Type 1 Diabetes TrialNet, a nationwide network conducting clinical trials to interdict type 1 diabetes. Dr. Skyler is a graduate of Penn State University and Jefferson Medical College, and did postgraduate training in Internal Medicine and in Endocrinology and Metabolism at Duke University. He was on the faculty at Duke, and worked two years at the Hypertension-Endocrine Branch (Section on Biochemical Pharmacology) of the National Heart and Lung Institute.

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Abbreviations

ADL's	activities of daily living
BP	blood pressure
CAD	coronary artery disease
CKD	chronic kidney disease
d	day
D/C	discharge
DM	diabetes mellitus
Dx	diagnosis
ETOH	ethanol, alcoholic beverages
Hx	history
O ₂	oxygen
prn	as needed, whenever necessary
QO	every other
SN	skilled nurse
SOB	short of breath
SPO ₂	pulse oximetry
s/s	signs and symptoms
w	week
x	times