

UniNet Healthcare Network
Continuing Medical Education

Hierarchical Condition Categories (HCC)
April 2019

Program Objectives:

- Describe risk adjustment methodology used by CMS
- List the criteria to appropriately document and code for HCCs
- Discuss commonly used HCCs and the medical record documentation required to support appropriate coding
- Discuss the 2019 update to version 23

*Prepared by Henry A. Sakowski II, MD and the UniNet Healthcare Network
Communication Education Committee. Edited by Kaye Bellino RN.*

Why the Fuss?

The Centers for Medicare and Medicaid Services (CMS) uses a risk-adjusted calculation in order to properly reimburse private insurers that manage Medicare recipients through Medicare Advantage plans and PACE (Program of All-inclusive Care for the Elderly) plans. CMS has expanded the use of this methodology to calculate the benchmark budget goals for Accountable Care Organization (ACO) participants in the Medical Shared Savings Program (MSSP), and it is also being used in the public healthcare exchange. UniNet participates in the MSSP, Medicare Advantage and exchange plans, and *it is critical that participating providers fully understand the requirements for proper documentation in the patient medical record, as well the importance of submitting an ICD-10 code for every chronic condition.* Similar payment models will be utilized by other third party insurers as they extend managed care products to the private sector. The Managed Medicaid plans in Nebraska and Iowa use a similar risk-adjustment methodology called CDPS + RX (Chronic Illness and Disability Payment System). CDPS is similar to the HCC model, but places a greater emphasis on less common, but costly chronic conditions that are more prevalent among disabled Medicaid beneficiaries.

The Hierarchical Condition Categories (HCC) were developed by researchers at Boston University and Harvard with funding from CMS.⁽¹⁾ Their goal was to create a valid risk-adjustment methodology using easily obtainable billing data (diagnosis codes submitted with associated claims) to accurately forecast future health care expenses. Starting with the ICD-9 billing system, the researchers attempted to identify a limited set of diseases and conditions that reliably reflect the extent that an individual's disease burden contributes to his/her healthcare costs. HCCs have been updated periodically to more accurately reflect patient risk and were recently converted to ICD-10 billing codes. Numeric values (points) were then assigned to each HCC in order to create a predictive tool—i.e., the risk assessment factor (RAF). HCC points accumulate over the calendar year for each patient to determine the RAF along with points contributed by each patient's demographic data (age, gender, an estimate of socioeconomic factors based on zip code information, disability status, and Medicaid eligibility).

HCCs + Demographic Data = RAF

Some of the Hierarchical Conditions are clustered within a diagnostic group and reflect hierarchies (or severity) among related illnesses. For example, if uncomplicated type 2 diabetes (E11.9) and type 2 diabetes with nephropathy (E11.21, N18.4) are submitted in the same calendar year, CMS will choose the diagnosis that map to the HCC associated with the greater severity of illness, HCC 18 (Diabetes with chronic complications) rather than HCC 19 Diabetes without complications.

The RAF for each patient is recalculated each year by adding up all the HCCs submitted the prior year. **This means that each chronic condition must be coded at least once each calendar year in order to provide an accurate risk-adjustment calculation and to budget the appropriate amount of money to care for that patient in the next calendar year. All billing codes (ICD-10) must be supported by documentation in a progress note generated by a face-to-face visit and signed by a qualified provider.** Each year CMS and other insurers audit medical records to verify that billing accurately reflects care provided.

Each performance year that an Accountable Care Organization (ACO) participates with the Medicare Shared Savings Program (MSSP), CMS adjusts the ACO's financial budget to account for changes in the health status of its assigned beneficiaries. Demographic data and HCCs are used to calculate a risk score for all *newly assigned* beneficiaries in the ACO. But for each beneficiary already attributed to an ACO in the previous year, CMS will recalculate a risk score annually using only demographic data – with HCC points being added to the calculation only if they went down from the previous year but not being used if they have increased. **This makes it essential to properly document and code all chronic conditions to the highest specificity the first year a patient is attributed to the ACO.**

The CMS-HCC Classification System begins with the 70,000+ ICD-10-CM codes and funnels into 805 diagnostic groups, which are further specified to 189 Condition Categories. It is at this point that hierarchies (severity) are imposed among related conditions, hence hierarchical condition categories. For payment year 2019, version 23 of HCC coding is in current use, and 83 of those 189 HCCs are active and designated a numerical score.⁽²⁾ Over 9500 ICD-10 codes map into one of the 83 HCCs used to risk adjust the Medicare population.⁽²⁾

New for 2019

In 2019, CMS switch to version 23 for HCC coding. New HCC additions include HCC 138 (CKD 3), HCC 55 (drug overdose/poisoning), HCC 56 (Substance abuse disorder), HCC 58 (reactive and unspecified psychosis), and HCC 60 (personality disorders).

What needs to be done?

In order for CMS to include an HCC when calculating a beneficiary's risk score and their predicted expenses, a provider's documentation of the face-to-face clinical encounter in the medical record must provide evidence of the diagnosis and its evaluation and/or management plan. The only acceptable data sources are medical records from hospital inpatient facilities, hospital outpatient facilities, physicians (MDs, DOs, DPMs, DCs, ODs) or practitioners (PAs, NPs, CNSs, Nurse-midwives and independently practicing Physical Therapists).

CMS requires that all conditions affecting a patient's care, treatment or medical management be documented in the patient's chart and coded.

Medical Record

While progress notes have historically functioned as a communication tool for providers, they are also used by payers to justify reimbursement based upon the level of care provided. As such, it is essential for providers to document adequately to demonstrate what conditions were diagnosed and/or managed during the encounter: i.e., the care provided.

- Documentation must **"MEAT"** certain requirements– i.e., not just a list or code for each condition, but an indication that it was:
 - **M**onitored
 - **E**valuated
 - **A**ssessed
 - **T**reated

- The greatest degree of certainty for each diagnosis must be documented (see linkage section below)
 - Symptoms (e.g. syncope, dyspnea) do not code to an HCC
- All chronic conditions must be assessed and documented at least once per year
 - **If discontinuing treatment for any diagnosed condition would cause that condition to resume, (e.g., medication or pacemaker), then the condition should be coded and its management documented**
- Conditions should be coded to the highest degree of specificity for that encounter (see specificity section below)
- Documenting “history of” for any currently existing disease or condition does not meet the requirement and must therefore be avoided

The Annual Visit

A patient’s annual Medicare visit is an opportune time to assess all past medical conditions.

- Medicare and all Medicare Advantage plans include medical benefits for an annual exam
- The provider reviews past medical history to compile a problem list including all existing chronic health problems
 - All acute problems that have been diagnosed need to be added to the problem list if they require continued management or to justify changes in the specificity of the billing codes
- The assessment and management of each health problem is documented in the medical record
- The highest and most specific ICD-10 codes for all documented ongoing health problems should be provided
 - Conditions with a range of intensity (e.g., diabetes) require careful coding to accurately indicate risk and costs

Coding to Capture the Correct HCC

Specificity

ICD-10 codes provide higher specificity than ICD-9 codes and include the chronic condition and its attendant complications in one code. Complications are coded in relationship to the appropriate chronic disease group rather than being coded separately. For example, neuropathy due to diabetes mellitus is correctly coded E110.40 rather than as diabetes mellitus E11.9 and polyneuropathy, unspecified G603.

- The more specific the code, the more accurately the disease severity burden (RAF) is reflected and the more accurately the expenses needed to care for that patient in the coming year can be predicted
- These are some examples of the increased specificity needs that are important to include in the documentation for risk adjustment:
 - Bronchitis:
 - Bronchitis not specified as acute or chronic > no HCC
 - Chronic bronchitis > HCC 111
 - Renal failure:
 - Renal failure > no HCC
 - Acute renal failure > HCC 135

- CKD:
 - Unspecified, Stage 1 or 2 > no HCC
 - Stage 3 > HCC 138 **NEW for 2019**
 - Stage 4 > HCC 137
 - Stage 5, ESRD > HCC 136
- Obesity:
 - Obesity > no HCC
 - Morbid obesity > HCC 22
- Depression
 - Major depressive disorder, single episode, unspecified > no HCC
 - Major depressive disorder, recurrent, mild > HCC 59

Linkage

When a provider's documentation reflects the underlying disease responsible for a complication, then the complication is considered to be *linked to the coding diagnosis and the most precise HCC and therefore an accurate RAF is achieved*. The medical record documentation must support the billing code by indicating the cause and effect between the complication and the underlying chronic condition.

It is important to avoid terms like "and" or "with" when documenting a complication of a chronic condition

Examples:

1. A diabetic patient comes to the clinic for evaluation of exertional leg pain and is diagnosed with claudication related to peripheral vascular disease. Compare the following 2 choices for documentation and how they relate to coding:
 - a. The provider documents "diabetes with peripheral vascular disease" and so the coder must submit the following separate ICD-9-DM codes:
 - i. E11.9 (uncomplicated type 2 diabetes) and
 - ii. I739 (peripheral vascular disease, unspecified)

OR
 - b. The provider specifies that the PVD is a complication of diabetes by documenting "PVD due to diabetes" and thereby captures a higher-value diabetes HCC
 - i. With a specific and accurate link of peripheral vascular disease to its underlying cause (in this case diabetes), the proper code: E11.51 (type 2 diabetes with peripheral angiopathy without gangrene)⁽³⁾ can be submitted and thereby reimbursement for care is improved
2. In order to link diabetes to diabetic neuropathy using the ICD-10 code E11.40 (Type 2 diabetes with diabetic neuropathy unspecified) there must be documentation in the medical record that the patient's peripheral *neuropathy* is due to the underlying diabetes.

Opportunities

With over 83 HCCs, it would be overwhelming to try and remember each and every condition tagged as an HCC. But focusing on a few common chronic conditions can still have a major impact on the risk score of a population and help insure appropriate reimbursement. Below is

a discussion of several common conditions that provide reasonable starting points because of their prevalence in the Medicare population, the negative impact they have on the overall patient health, and the high cost associated with their presence. Correct coding is also important as it alerts other providers to existing complications. This helps support appropriate management, such as prescribing an ACE inhibitor or ARB for patients with diabetes complicated by nephropathy.

Improved UniNet ACO Diabetes Coding:

A review of UniNet ACO participants in 2015 revealed that compared to other MSSP participants, we tend to submit lower-specificity diabetic codes. For example, 68% of our Medicare patients with diabetes were coded as “controlled and uncomplicated” (E11.9) although medical literature reports that **over 60% of patients with diabetes have long term complications related to their disease.**⁽³⁾ In 2017, the percent of UniNet diabetic patients coded with chronic complications approached 60% demonstrating providers improved coding and documentation.

One benefit of ICD-10 over ICD-9 is that providers can identify most diabetic manifestations with just one code. However, gastroparesis, skin ulcers and CKD still require one code for the diabetes and one for the complication.

Accurately Coding Diabetes:

- E11.2 Type 2 diabetes mellitus with kidney complications
 - * Coded by the stage of chronic kidney disease (N18.1-N18.6)
- E11.3 Type 2 diabetes mellitus with ophthalmic complications
- E11.4 Type 2 diabetes mellitus with neurological complications
 - * Code with gastroparesis (K31.84) if appropriate
- E11.5 Type 2 diabetes mellitus with circulatory complications
- E11.6 Type 2 diabetes mellitus with other specified complications
 - * Skin ulcers coded (L97.1-L97.9, L98.41-L98.49)
- E11.8 Type 2 diabetes mellitus with unspecified complications
- E11.9 Type 2 diabetes mellitus without complications
- V794 An appendage added on type 2 diabetes codes to reflect a higher degree of necessary management

Tip for EPIC users regarding choosing “complicated” or “uncomplicated” diabetes:

Typing in “diabetes” and the specific complication in the problem list search box quickly provides the proper code for diabetes and the associated complication. This will appropriately link the complication to the diabetes diagnosis (i.e. “PVD due to diabetes”) in your documentation.

Diabetes HCCs:

There are over 200 codes for diabetes in ICD-10. For the current version 23 of HCC coding, the diabetic HCCs were reduced from **five** disease-driven categories to **three** complication-driven categories (HCC “Clusters”).

Version 23

HCC 17 Diabetes with **Acute**

Complications

- E10.1X Type 1 diabetes mellitus with ketoacidosis
- E10.6X Type 1 diabetes mellitus with hypoglycemia with coma
- E11.XX Type 2 diabetes mellitus with hyperosmolarity
- E11.6X Type 2 diabetes mellitus with hypoglycemia with coma

HCC 18 Diabetes with **Chronic**

Complications

- E11.2X Type 2 diabetes with renal manifestations
- E11.3X Type 2 diabetes with ophthalmic manifestations
- E11.4X type 2 diabetes with neurological manifestations
- E11.5X Type 2 diabetes with peripheral circulatory disorders
- E11.6X Type 2 diabetes with other specified complications (arthropathy, skin ulcers, oral complications)
- E11.8X Type 2 diabetes with unspecified complications

HCC 19 Diabetes Without

Complications

- E11.9 Diabetes w/o complications

Chronic Kidney Disease (CKD) HCC's

Studies indicate that over 40% of individuals over age 65 have some form of chronic kidney disease (stages 1-5). Yet, 70-75% are undiagnosed, primarily because so many people are not recognized in the early stages of CKD.⁽⁴⁾ CKD is defined as either kidney damage or a GFR < 60 ml/min/1.73 m² for 3 or more months. The stage of the CKD should be reported based on documented clinical findings including the glomerular filtration rate (GFR). The stages of CKD are coded differently.

STAGE	GFR	ICD-10 code
➤ Stage 1*	≥ 90 ml/min	N18.1
➤ Stage 2*	60-89 ml/min	N18.2
➤ Stage 3	30-59 ml/min	N18.3
➤ Stage 4	15-29 ml/min	N18.4
➤ Stage 5	< 15 ml/min	N18.5
➤ ESRD**		N18.6
➤ CKD unspecified		N18.9

* Stage 1 and 2 also require other evidence of renal disease (proteinuria, evidence of structural damage on imaging, etc.)

**Patients coded with 585.6 (end-stage renal disease) should also be assigned one of the following codes:

Z99.2 for patients on dialysis

Z91.15 if non-compliant with dialysis

Z94.0 if received a kidney transplant

Kidney Disease HCCs:

In the present version CKD stage 1 and 2 do not impact a patient's risk score, **only CKD stage 3, (GRF 30-59 mL/min per 1.73 m²) stage 4 (GFR 15-29 mL/min per 1.73 m²) and stage 5 (GFR < 15 mL/min per 1.73 m² or ESRD) map to an HCC**

Version 23

HCC 134 Dialysis Status

HCC 135 Acute Renal Failure

HCC 136

- N18.5 Chronic Kidney Disease (stage 5)
- N18.6 ESRD
- N12.0 Stage 5 hypertensive (HTN) CKD
- N13.11 Stage 5 HTN heart and CKD
- N13.2 Stage 5 HTN heart and CKD with heart failure

HCC 137

- N18.4 Chronic Kidney Disease (stage 4)

HCC 138

- N18.3 Chronic Kidney Disease (stage 3) **NEW for 2019**

Peripheral Artery Disease (PAD): HCC 106, 107 and 108

The key to properly coding PAD starts with timely identification. As many as 75% of patients with PAD may be asymptomatic, which makes it essential to screen for it in order to achieve early diagnosis and management.⁽⁵⁾ Although recommendations vary for PAD screening, the condition is associated with both coronary and cerebral artery disease and therefore its recognition can contribute to early diagnosis of other potentially catastrophic conditions. It is known that 96% of patients with PAD have at least one of the following four risk factors: diabetes, smoking, hypertension or hyperlipidemia. In the US, 6% of the population over the age of 40 has a low ankle-brachial index (ABI), i.e., ≤ 0.9 ⁽⁶⁾ and that number increases to 21% in the Medicare population.⁽⁷⁾

Symptoms of PAD include intermittent claudication, muscle or limb weakness with use, resting limb pain or paresthesia and poor healing of sores or ulcerations. Physical examination of an affected limb often reveals decreased pulses, decreased capillary refilling, increased venous filling time, atrophic skin changes, loss of hair, discoloration of skin, decreased warmth and vascular bruits. An ABI test is generally accepted as the initial step for diagnosing PAD.⁽⁸⁾

Peripheral atherosclerotic disease is one of the conditions that ICD-10 greatly expanded with over 500 codes mapped to three HCCs: HCC 106, 107 and 108. Peripheral vascular disease is a generic term that does not require that the location of disease be identified.

There are now five ICD-10 codes replacing ICD-9 code 440.21 (symptomatic atherosclerosis of native arteries):

- I70.211 Atherosclerosis of native arteries of extremities with intermittent claudication, right leg
- I70.212 Atherosclerosis of native arteries of extremities with intermittent claudication, left leg

- I70.213 Atherosclerosis of native arteries of extremities with intermittent claudication, bilateral legs
- I70.218 Atherosclerosis of native arteries of extremities with intermittent claudication, other extremity
- I70.219 Atherosclerosis of native arteries of extremities with intermittent claudication, unspecified

There are now twelve ICD-10 codes replacing ICD-9 code 440.23 (atherosclerosis of native arteries of the extremities with ulceration):

- I70.231 Atherosclerosis of native arteries of right leg with ulceration of thigh
- I70.232 Atherosclerosis of native arteries of right leg with ulceration of calf
- I70.233 Atherosclerosis of native arteries of right leg with ulceration of ankle
- I70.234 Atherosclerosis of native arteries of right leg with ulceration of heel and midfoot
- I70.235 Atherosclerosis of native arteries of right leg with ulceration of other part of foot
- I70.238 Atherosclerosis of native arteries of right leg with ulceration of other part of lower right leg
- I70.239 Atherosclerosis of native arteries of right leg with ulceration of unspecified site
- I70.241 Atherosclerosis of native arteries of left leg with ulceration of thigh
- I70.242 Atherosclerosis of native arteries of left leg with ulceration of calf
- I70.243 Atherosclerosis of native arteries of left leg with ulceration of ankle
- I70.244 Atherosclerosis of native arteries of left leg with ulceration of heel and midfoot
- I73.9 Unspecified PVD

Other Commonly Used HCCs⁽⁹⁾

There are several HCCs that occur frequently but are often underreported because the documentation is incomplete. Recognizing and documenting these conditions so that they can be appropriately coded will have a large impact on patient risk scores.

HCC 22 Morbid Obesity (to be applied only to ages 15 years and older with a BMI >40)

- E66.01 Morbid (severe) obesity - can only be used for a documented face-to-face discussion between the provider and the patient
- E66.02 Obesity hypoventilation syndrome
- BMI status (codes can be used if documented by ancillary staff)
 - Z68.41 BMI 40.0-44.9, adult
 - Z68.42 BMI 45.-49.9, adult
 - Z68.43 BMI 50.0-59.9, adult
 - Z68.44 BMI 60.0-69.9, adult
 - Z68.45 BMI 70.0 and over, adult

HCC 85 Heart Failure

There are 61 ICD-10 codes that map to HCC 85 representing different types and manifestations of acute and chronic heart failure. Our ACO's coding for heart failure is significantly lower than our peer ACOs across the country. Heart failure also can lead to high RAF scoring when present

with other chronic conditions like COPD, these interaction factors adjust for the multiplicative impact of multiple chronic conditions on a patient's overall health.

HCC 59 Major Depression

"A depressive disorder" or "depression" are not included in the Diagnostic and Statistical Manual of Mental Disorders (DSM) and represent an ambiguous condition with a mental state of depressed mood characterized by feelings of sadness, despair and discouragement. It is an unpleasant, but not necessarily irrational or pathological, mood state characterized by sadness, despair, or discouragement, often referred to as "the blues". It may involve low self-esteem, social withdrawal, and somatic symptoms such as eating and sleep disturbances. These symptoms describe mild depression which is not considered to be clinical depression.

For clinical depression, the provider must use the terminology "major depression." For patients being treated for depression who are no longer exhibiting signs and symptoms, the provider must continue to document major depression along with the level of remission (partial or complete) using the following ICD-10 codes:

- F33.0 Major Depression (Defined by one or more of the following symptoms that are present for at least 2 weeks and are not due to substance abuse):
 - Depressed mood most of the day and nearly every day for at least 2 weeks
 - Diminished interest or pleasure in activities, plus 3-4 of the following:
 - Significant change in appetite
 - Sleep disturbance
 - Lack of energy
 - Psychomotor retardation or agitation
 - Difficulty concentrating
 - Feelings of guilt or worthlessness
 - Suicidal ideation
- F32.0-4 single episode
- F33.8-9 recurrent episode

NEW for 2019

HCC 58 Reactive & Unspecified Psychosis, 60 Personality Disorders

Conditions in HCC 58 are those that are related to schizophrenia but don't meet the full criteria for schizophrenia or other related disorders.

HCC 60 consists of well-defined personality disorders.

- Paranoid personality disorder
- Schizoid personality disorder
- Antisocial personality disorder
- Borderline personality disorder
- Histrionic personality disorder
- Obsessive-compulsive personality disorder
- Avoidant personality disorder
- Dependent personality disorder
- Narcissistic personality disorder

HCC 56: Substance Use Disorder, Mild, Except Alcohol and Cannabis

Including opioids, stimulants, hallucinogens, sedative and inhalants.

HCC 21 Protein-calorie malnutrition (E43, E44.0, E44.1, E46)

This condition is prevalent in patients with cancer, CKD, liver disease, drug or alcohol abuse, anemia and pancreatitis.⁽¹⁰⁾ It should be considered in patients with a BMI <19, 10% weight loss in the previous 6 months, an albumin <3.5 and/or evidence of muscle wasting or fat loss.

- E43 Unspecified severe protein-calorie malnutrition
- E44 Mild or moderate (weight for age 75-89% of standard)
- E46 Unspecified protein-calorie malnutrition

Attention to Ostomies/Amputations – Any amputation or ostomy must be noted in the medical record annually and submitted with the appropriate ICD-10 code.

HCC 188 Gastrointestinal ostomy

- Z93.1 Gastrostomy
- Z93.2 Ileostomy
- Z93.3 Colostomy
- Z93.5 Cystostomy

HCC 82 Tracheostomy Z93.0

HCC 173 Initial encounter amputations

HCC 189 Amputation sequela (used annually to document amputation status)

Summary

To capture the most accurate HCC/RAF the risk-adjusted diagnosis must be⁽¹¹⁾

- Based on clinical medical record documentation of a face-to-face encounter
- Coded according to the official ICD-10-CM Guidelines for Coding and Reporting
- Assigned based on dates of service within the data collection period
- Submitted to the Medicare Advantage (MA) organization (or CMS) from an appropriate provider type and physician data source

Documentation Tips for Provider Practice⁽⁹⁾

- Add any risk-adjusted diagnoses to both the chronic problem list and the acute assessment (office note).
- Evaluate each of the patient's chronic conditions on a semi-annual basis, document in the medical record and code for the condition.
- Review all specialist documentation, master discharge summaries, radiology, specialty correspondence, pulmonary, echocardiograms, and x-rays to identify any pertinent conditions that should be entered into the patient's problem list.
- Review documentation regarding the patient's past history, laboratory results, medications and previous encounters.

This introduction to the Medicare risk adjustment methodology presents a starting point for providers to understand and tackle the required medical record documentation and subsequent coding that has a major impact on reimbursement. Although the conditions

discussed represent only a fraction of the 83 HCCs in version 23, they are common in the Medicare population and therefore their appropriate documentation and coding will make a difference in reimbursement. Patient care is enhanced by a provider who maintains accurate, up-to-date patient problem lists with regular, ongoing attention to all chronic conditions.

References

- 1) Pope G, Kautter J, Ellis R, Ash A, Ayanian J, Iezzoni L, Igber M, et al. Risk adjustment of Medicare capitation payments using the CMS-HCC model. *Health Care Financing* 2004;25:119-141.
- 2) Midyear final ICD-10 CM mapping. Available at <https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Risk-Adjustors-Items/RiskModel2019.html?DLPage=1&DLEntries=10&DLSort=0&DLSortDir=descending> Accessed 3/12/2019.
- 3) Blonde L. The state of diabetes complications in America, American Association of Clinical Endocrinologists, 4/2007. Accessed 10/14/14 at <http://www.ajmc.com/publications/supplement/2007/2007-04-vol13-n2Suppl/Apr07-2475pS36-S40/>.
- 4) Stevens L, Li S, Wang C, Huang C, Becker B, et al. Prevalence of CKD and co-morbid illness in elderly patients in the United States: Results from the Kidney Early Evaluation Program (KEEP). *Am J Kidney Dis* 2010;55:S23-S33.
- 5) Roger VL, Go AS, Lloyd-Jones DM, et. al. Heart Disease and Stroke Statistics 2011 Update: A Report From the American Heart Association. *Circulation* 2011;123:e18-e209.
- 6) Pande, R Perlstein T, Beckman J, Creafer M. Secondary prevention and mortality in peripheral artery disease: National Health and Nutrition Examination Study 1999 to 2004. *Circulation* 2011;124:17-23.
- 7) Diehm C, Allenberg JR, Pittrow D, et al. Mortality and vascular morbidity in older adults with asymptomatic versus symptomatic peripheral artery disease. *Circulation* 2009;120:2053– 61.
- 8) Wikstrom J, Hansen T, Johansson L, Lind L, Ahlstrom H. Ankle brachial index < 0.9 underestimates the prevalence of peripheral artery occlusive disease assessed with whole-body magnetic resonance angiography in the elderly. *Acta Radiol* 2008;49:143-149.
- 9) 2014 CMS-HCC Model Updates. Health Alliance. A blog about Hierarchical Condition Coding (HCC).mht posted February 28, 2014. Accessed 5/13/15 at www.CodingCounts.com.
- 10) Hoffer, John L. "Clinical Nutrition: 1. Protein-energy Malnutrition in the Inpatient." Ed. Canadian Medical Association Journal. (2001)
- 11) Accurate hierarchical condition category capture hinges upon accurate physician coding. January 4, 2012. Accessed 5/13/14 at <http://www.hcpro.com/HIM-274859-3288/Accurate-hierarchical-condition-category-capture-hinges-upon-accurate-physician-coding.html>.

