

**Appendix Table 1.** List of the Comorbid Conditions and Associated ICD-9 Codes Used in the Modified Elixhauser Comorbidity Index (EI)

<b>Comorbid condition</b>	<b>ICD-9</b>
<b>A. Cardiovascular disease (CVD) and hypertension-related</b>	
Congestive heart failure	428
Heart rhythm disorders <sup>a</sup>	426, 427
Valvular disease	394–397, 424, 746
Coronary heart disease <sup>b</sup>	410–414
Stroke <sup>b</sup>	430–438
Hyperlipidemia <sup>b</sup>	272
Pulmonary circulation disorders	415–417
Peripheral vascular disorders	440, 441, 443, 447, 557
Diabetes <sup>c</sup>	250
Renal disease <sup>d</sup>	585, 586, 588, V56
Obesity	278
Depression	296, 300, 309, 311
<b>B. Others</b>	
Paralysis	334, 342–344
Neurological disorders	331–336, 340, 341, 345, 348
Hypothyroidism	240, 243, 244, 246
Liver disease	070, 456, 570–573
Peptic ulcer	531, 532, 533, 534
HIV/AIDS	042–044
Lymphoma	200–203
Metastatic cancer	196, 197, 198, 199
Solid tumor	140–172, 174–195
Rheumatoid arthritis	446, 701, 710, 711, 714, 719, 720, 725, 728
Coagulopathy	286, 287
Weight loss	260–263
Fluid and electrolyte disorders	276
Anemia <sup>e</sup>	280, 281
Alcohol abuse	291, 303, 980
Drug abuse	292, 304, 305
Psychoses	293, 295, 297, 298
Chronic pulmonary disease	416, 490–496, 500–505

<sup>a</sup>Arrhythmia in the original EI was renamed heart rhythm disorders for this study.

<sup>b</sup>These CVD conditions were not included in the original EI, but they were added to the modified EI in this study.

<sup>c</sup>Diabetes was included as two groups (diabetes with complications, diabetes without complications) in the original EI, but the groups were combined into one group in this study.

<sup>d</sup>Renal failure in the original EI was renamed renal disease for this study.

<sup>e</sup>Anemia was included as two groups (blood loss anemia and deficiency anemia) in the original EI, but these were combined into one group in the present study.

**Appendix**  
**Comorbidity Status and Annual Total Medical Expenditures in U.S. Hypertensive Adults**  
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**Appendix Table 2.** Generalized Linear Model Estimates on Total Medical Expenditures in U.S. Hypertensive Adults, 2011–2014 Medical Expenditure Panel Survey (n=26,049)

<b>Variable</b>	<b>Coefficient (SE)</b>	<b>p-value</b>
<b>Elixhauser comorbidity index</b>		
0	–0.76 (0.07)	<0.001
1	–0.36 (0.05)	<0.001
2	ref	
≥3	0.51 (0.04)	<0.001
<b>Age group, years</b>		
18–44	–0.21 (0.07)	0.004
45–64	ref	
≥65	0.02 (0.03)	0.495
<b>Gender</b>		
Male	ref	
Female	0.07 (0.03)	0.041
<b>Race/ethnicity</b>		
Hispanic	–0.20 (0.06)	<0.001
White, non-Hispanic	ref	
Black, non-Hispanic	–0.11 (0.04)	0.003
Asian and other, non-Hispanic	–0.20 (0.06)	0.002
<b>Region</b>		
Northeast	ref	
Midwest	–0.06 (0.06)	0.331
South	–0.18 (0.05)	0.001
East	–0.09 (0.06)	0.158
<b>Insurance</b>		
Any private	ref	
Public only	–0.07 (0.04)	0.055
Uninsured	–0.74 (0.10)	<0.001
<b>Marital status</b>		
Married	ref	
Unmarried	0.06 (0.04)	0.118
<b>Education</b>		
Less than high school	–0.03 (0.06)	0.603
High school	ref	
College or higher	0.13 (0.03)	<0.001
<b>Poverty level</b>		
Negative/poor/low	0.08 (0.04)	0.057
Middle	ref	
High	0.08 (0.04)	0.075
<b>Smoking</b>		
Yes	ref	
No	0.14 (0.05)	0.009
<b>Health status</b>		
Excellent	–0.15 (0.06)	0.012
Very good	ref	
Good	0.29 (0.04)	<0.001
Fair /poor	0.76 (0.04)	<0.001
Constant	8.61 (0.09)	<0.001

*Note:* The results were generated from the generalized linear model (GLM) with log link and gamma distribution.

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**Appendix Table 3.** Estimated Annual Medical Expenditures (2014 U.S. Dollars) by 15 Most Frequent Comorbid Conditions in U.S. Hypertensive Adults, 2011–2014 Medical Expenditure Panel Survey

Comorbid condition	Medical expenditures, \$ (95% CIs)		Difference in medical expenditures
	Without comorbid condition	With comorbid condition	
<b>A. Cardiovascular disease (CVD) and hypertension-related</b>			
Congestive heart failure	9,683 (9,313–10,053)	17,063 (16,224–17,902)	7,380
Stroke	9,555 (9,190–9,920)	15,624 (14,903–16,345)	6,069
Coronary heart disease	8,818 (8,490–9,146)	14,864 (14,155–15,573)	6,046
Heart rhythm disorders	9,528 (9,169–9,887)	14,621 (13,904–15,338)	5,093
Diabetes	8,468 (8,145–8,790)	13,506 (12,929–14,084)	5,039
Renal disease	9,274 (8,925–9,623)	14,248 (13,601–14,895)	4,974
Depression	8,597 (8,287–8,906)	13,523 (12,887–14,159)	4,926
Hyperlipidemia	7,114 (6,855–7,372)	11,965 (11,457–12,472)	4,851
Valvular disease	9,776 (9,402–10,149)	14,228 (13,475–14,981)	4,453
<b>B. Others</b>			
Neurological disorders	9,635 (9,269–10,001)	15,766 (14,988–16,544)	6,131
Chronic pulmonary disease	8,943 (8,612–9,274)	14,183 (13,514–14,851)	5,240
Solid tumor	9,538 (9,177–9,899)	14,452 (13,759–15,144)	4,914
Fluid and electrolyte disorders	9,717 (9,346–10,088)	14,377 (13,705–15,049)	4,660
Hypothyroidism	9,313 (8,968–9,658)	13,568 (12,909–14,226)	4,254
Rheumatoid arthritis	8,783 (8,462–9,104)	12,688 (12,127–13,249)	3,905

*Note:* The mean annual medical expenditures were estimated using the average marginal effects method from the generalized linear model (GLM) with log link and gamma distribution.