



Employers for Healthcare Value Since 1980

LEHIGH VALLEY BUSINESS COALITION ON HEALTHCARE TYPE 2 DIABETES REPORT™ | 2017



5th Edition

▶ With a Focus on How Cardiovascular Conditions Can Impact Diabetes Care

Introduction

Sanofi U.S. (Sanofi), in conjunction with the Lehigh Valley Business Coalition on Healthcare (LVBCH), is pleased to present the fifth edition of the **LVBCH Type 2 Diabetes Report™** for 2017, an overview of key pharmacotherapy, utilization, charge, and demographic measures for Type 2 diabetes patients, as well as a focus on how cardiovascular conditions can impact diabetes care. The report also provides benchmarks from neighboring states and the nation that can help providers and employers identify opportunities to better serve the needs of their patients. All data are drawn from the Sanofi **Managed Care Digest Series®**.

The data in this report (current as of calendar year 2016) were gathered by QuintilesIMS, Durham, NC, a leading provider of innovative health care data products and analytic services. A review process takes place, before and during production of this report, between QuintilesIMS and Forte Information Resources, LLC.

Sanofi, as sponsor of this report, maintains an arm’s-length relationship with the organizations that prepare the report and carry out the research for its contents. The desire of Sanofi is that the information in this report be completely independent and objective.

LVBCH Employer Members work together to bring value and innovation in the health care marketplace. For a list of organizations, please visit www.lvbch.com. The role of LVBCH is to help make these data more widely available to interested parties.

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PATIENT DEMOGRAPHICS



DISTRIBUTION OF TYPE 2 DIABETES PATIENTS, BY AGE, 2014-2016

MARKET	0-17			18-35			36-64			65-79			80+		
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
Allentown	0.6%	1.3%	1.8%	2.6%	2.7%	2.8%	40.7%	41.4%	42.6%	39.0%	38.6%	37.9%	17.1%	16.0%	14.9%
Harrisburg	0.7	1.5	2.3	2.2	2.5	2.4	39.3	39.5	40.1	40.8	41.0	40.8	17.0	15.6	14.3
Reading	0.3	0.4	0.5	2.4	2.4	2.4	41.6	42.2	41.2	38.6	38.4	38.8	17.2	16.5	17.2
Scranton	0.5	1.4	1.7	2.3	2.3	2.1	38.2	38.0	37.6	40.1	40.7	41.4	18.9	17.7	17.2
Pennsylvania	0.7	1.5	1.9	2.8	2.8	2.8	42.0	42.2	42.3	38.4	38.4	38.7	16.2	15.0	14.3
NATION	0.5%	1.0%	1.4%	2.9%	3.0%	3.0%	45.1%	45.0%	44.7%	38.4%	38.4%	38.7%	13.2%	12.7%	12.2%

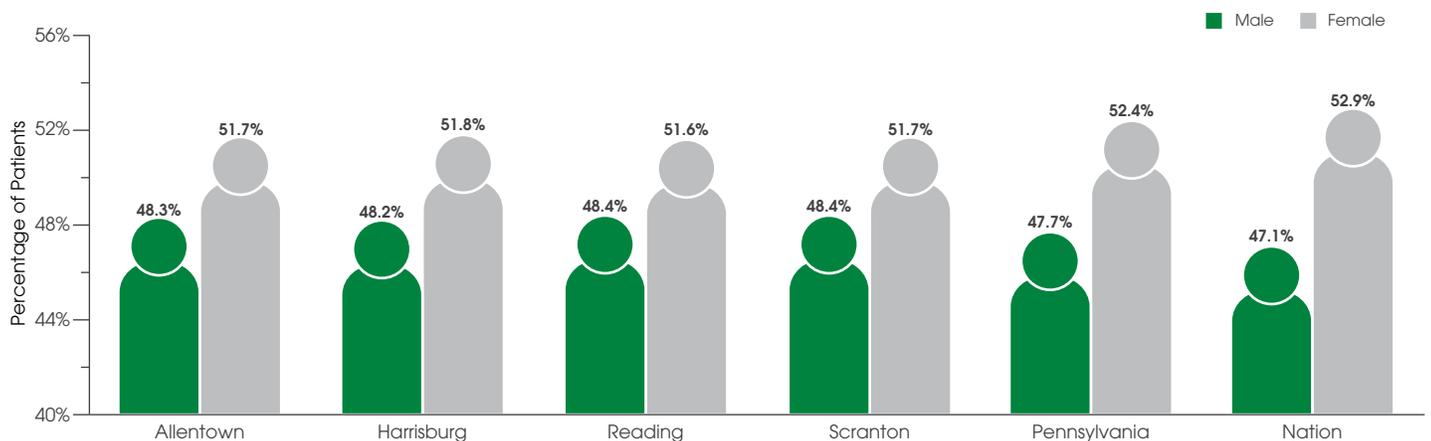
PERCENTAGE OF TYPE 2 DIABETES PATIENTS, BY DIAGNOSING SPECIALIST, 2015-2016

MARKET	Primary Care ¹		Internal Medicine		Endocrinology		Cardiology	
	2015	2016	2015	2016	2015	2016	2015	2016
Allentown	21.6%	21.8%	18.4%	17.5%	3.3%	3.2%	4.0%	4.0%
Harrisburg	29.9	30.6	15.6	15.2	2.7	2.8	2.8	2.4
Reading	35.5	35.2	23.8	23.9	2.4	2.6	3.1	3.1
Scranton	26.4	25.3	20.8	21.4	5.5	5.4	3.1	3.0
Pennsylvania	28.1	28.4	21.2	20.9	5.6	5.5	4.3	4.1
NATION	27.6%	27.7%	23.4%	23.0%	4.6%	4.5%	4.5%	4.4%

WORKING-AGE SHARES OF TYPE 2 DIABETES PATIENTS IN PA MARKETS GROW

In three of the five profiled Pennsylvania markets, the shares of working-age Type 2 diabetes patients (aged 18-64 years) increased. In Allentown, for example, this percentage climbed by more than two percentage points, to 45.4% in 2016 from 43.3% in 2014.

DISTRIBUTION OF TYPE 2 DIABETES PATIENTS, BY GENDER, 2016



Data source: QuintilesIMS © 2017

¹ "Primary care" consists of both general and family practitioners.

NOTE: Throughout this report, the Allentown market includes Bethlehem and Easton, the Harrisburg market includes Lebanon and Carlisle, and the Scranton market includes Wilkes-Barre and Hazleton.

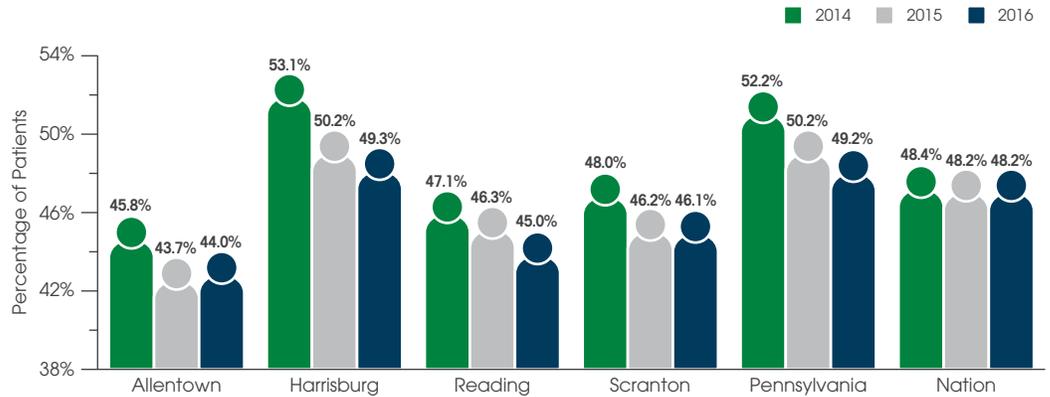
SHARES OF COMMERCIALLY INSURED PENNSYLVANIA TYPE 2 DIABETES PTS. DECLINE

From 2015 to 2016, the percentages of Type 2 diabetes patients with commercial insurance decreased slightly in four of the five profiled Pennsylvania markets (Allentown excepted). In 2016, the share of such patients was highest, by profiled market, in Harrisburg (49.3%)—a portion that exceeded the corresponding means for Pennsylvania overall (49.2%) and the nation (48.2%). Allentown had the lowest percentage of such patients of the markets shown in 2016, at 44.0%.

PERCENTAGE OF TYPE 2 DIABETES PATIENTS, BY PAYER, 2015–2016

MARKET	Commercial Insurance ¹		Medicare		Medicaid	
	2015	2016	2015	2016	2015	2016
Allentown	43.7%	44.0%	43.8%	41.4%	12.0%	14.1%
Harrisburg	50.2	49.3	38.8	38.7	10.1	11.0
Reading	46.3	45.0	40.9	41.5	12.4	13.0
Scranton	46.2	46.1	44.5	43.8	8.7	9.3
Pennsylvania	50.2	49.2	35.6	35.2	13.2	14.2
NATION	48.2%	48.2%	38.1%	37.2%	12.5%	13.3%

PERCENTAGE OF TYPE 2 DIABETES PATIENTS WITH COMMERCIAL INSURANCE, 2014–2016¹



PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS, BY ACTUAL COMPLICATION, 2016^{1,2}

MARKET	AMI	Cardio-vascular Disease	Nephropathy	Neuropathy	PAD	Retinopathy	Severe Hypo-glycemia	Stroke
Allentown	2.6%	34.0%	23.7%	33.6%	14.6%	21.0%	3.4%	3.7%
Harrisburg	3.6	32.7	30.8	32.5	14.9	17.6	3.2	4.0
Reading	3.1	46.9	26.4	29.8	12.4	24.5	3.7	5.4
Scranton	2.6	42.7	25.6	38.3	20.4	20.2	2.8	3.9
Pennsylvania	3.0	39.1	29.6	34.5	16.2	17.5	3.6	4.7
NATION	2.7%	37.6%	31.5%	34.5%	13.9%	16.2%	3.7%	4.1%

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS, BY ACTUAL COMORBIDITY, 2016^{1,3}

MARKET	Depression	Hyperlipidemia	Hypertension	Obesity
Allentown	11.9%	63.2%	76.4%	19.2%
Harrisburg	11.4	55.5	80.3	25.4
Reading	13.2	71.1	84.4	21.2
Scranton	11.0	57.0	79.6	28.5
Pennsylvania	11.7	61.2	78.1	29.3
NATION	10.9%	63.0%	79.5%	23.8%

Data source: QuintilesIMS © 2017

¹ Includes HMOs, PPOs, point-of-service plans, and exclusive provider organizations.

² A complication is defined as a patient condition caused by the Type 2 diabetes of the patient. These conditions are a direct result of having Type 2 diabetes. Complications of Type 2 diabetes include, but are not limited to, acute myocardial infarction (AMI), cardiovascular (CV) disease, severe hypoglycemia, nephropathy, neuropathy, peripheral artery disease (PAD), and retinopathy.

³ A comorbidity is a condition a Type 2 diabetes patient may also have, which is not directly related to the diabetes. Comorbidities were narrowed down to a subset of conditions that are typically present in patients with Type 2 diabetes. Comorbidities of Type 2 diabetes may include, but are not limited to, depression, hyperlipidemia, hypertension, and obesity.

USE OF SERVICES



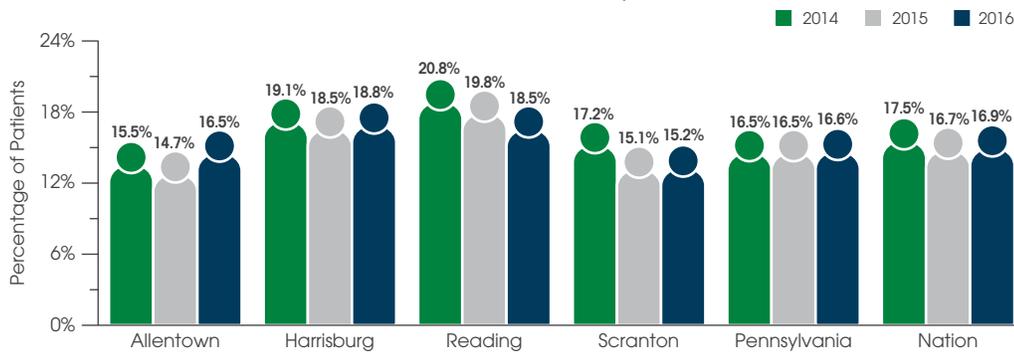
PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS RECEIVING VARIOUS SERVICES, 2014-2016¹

MARKET	A1c Test ²			Blood Glucose Test			Ophthalmologic Exam			Serum Cholesterol Test			Urine Glucose Test		
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
Allentown	77.9%	80.5%	82.9%	86.2%	87.9%	87.9%	69.8%	69.2%	68.3%	85.6%	86.0%	87.2%	85.6%	85.7%	85.6%
Harrisburg	78.7	78.7	78.5	87.4	87.8	88.2	68.5	69.3	68.0	85.8	86.0	86.6	85.6	85.3	85.6
Reading	81.8	82.1	84.2	86.1	86.7	85.7	75.4	75.7	79.3	84.9	85.2	85.1	85.4	85.3	85.2
Scranton	79.3	79.0	78.3	87.2	87.6	86.8	69.5	69.7	68.6	85.9	86.7	85.6	85.3	84.9	85.5
Pennsylvania	79.2	79.4	79.3	87.6	87.5	87.2	67.4	67.1	66.8	86.5	86.3	86.2	85.8	85.7	85.7
NATION	77.0%	77.0%	76.9%	86.8%	86.7%	86.6%	66.9%	66.9%	66.6%	84.5%	84.4%	84.4%	83.0%	82.9%	82.8%

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS, BY SERVICE: TOP-PERFORMING STATE, 2016^{1,3}

TOP-PERFORMING STATE ³	A1c Test ²	Blood Glucose Test	Ophthalmologic Exam	Serum Cholesterol Test	Urine Glucose Test
	88.4%	95.8%	78.0%	93.9%	96.0%

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS WITH AN A1c LEVEL RANGE >9.0%, 2014-2016^{1,2}



PENNSYLVANIA TYPE 2 DIABETES PTS. ARE MORE APT TO RECEIVE AN A1c TEST

In 2016, commercially insured Type 2 diabetes patients in all five of the profiled Pennsylvania markets were more likely to get an A1c test than their counterparts nationally (76.9%); the percentage of such patients was highest in Reading that year, at 84.2%.

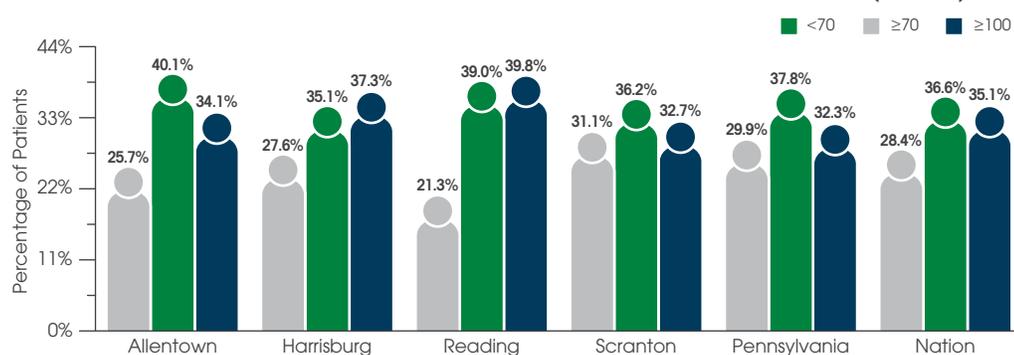
PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS, BY A1c LEVEL RANGE: TOP-PERFORMING STATE, 2016^{1,2,3}

TOP-PERFORMING STATE ³	≤7.0%	>9.0%
	54.1%	12.0%

SHARES OF PENNSYLVANIA TYPE 2 DIABETES PATIENTS WITH AN A1c >9.0% RISE

From 2015 to 2016, the percentages of commercial Type 2 diabetes patients with an A1c level above 9.0% increased in four of the five Pennsylvania markets profiled (Reading excepted). Further, the shares of such patients in Reading and Harrisburg exceeded that of the nation (16.9%) in 2016.

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS, BY LDL-C LEVEL RANGE (MG/DL), 2016¹



Data source: QuintilesIMS © 2017

¹ Includes HMOs, PPOs, point-of-service plans, and exclusive provider organizations.

² The A1c test measures the amount of glucose present in the blood during the past 2-3 months. Figures reflect the percentage of Type 2 diabetes patients who have had at least one A1c test in a given year.

³ The top-performing state represents the state with the highest percentage of Type 2 diabetes patients receiving a given service, and may vary by service.

NOTE: LDL-C is low-density lipoprotein cholesterol.

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS RECEIVING VARIOUS INSULIN THERAPIES, 2014-2016^{1,2}

MARKET	Any Insulin Products			Long-Acting Insulin: Gen 1			Long-Acting Insulin: Gen 2			Rapid-Acting Insulin			Mixed Insulin		
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
Allentown	31.5%	29.6%	29.0%	21.9%	20.8%	19.3%	n/a	0.7%	3.4%	17.5%	16.3%	15.0%	3.1%	2.5%	2.3%
Harrisburg	29.0	30.7	30.2	21.8	23.3	21.7	n/a	0.9	3.4	16.2	16.3	14.5	2.2	2.4	2.1
Reading	25.9	27.2	28.4	18.8	19.7	19.0	n/a	0.7	4.2	15.3	16.8	15.3	2.3	2.1	1.8
Scranton	31.5	30.9	28.6	23.0	21.8	17.4	n/a	1.1	4.8	20.4	19.9	17.8	2.9	2.8	2.3
Pennsylvania	32.8	32.5	32.0	23.5	23.1	21.8	n/a	0.9	3.8	18.1	18.1	17.8	4.1	3.6	3.1
NATION	31.5%	30.5%	30.0%	23.2%	22.4%	20.6%	n/a	1.2%	4.0%	16.4%	15.9%	15.4%	3.3%	2.9%	2.4%

PA TYPE 2 DIABETES PTS. ARE LESS LIKELY THAN U.S. PTS. TO FILL GEN 2 L-A INSULINS

In Allentown (3.4%), Harrisburg (3.4%), and across the Commonwealth of Pennsylvania (3.8%), the percentages of Type 2 diabetes patients who filled prescriptions for a second generation long-acting insulin in 2016 trailed the national average (4.0%).

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS RECEIVING VARIOUS INSULIN THERAPIES, PENS VS. VIALS, 2016^{1,2}

MARKET	Any Insulin Products	Long-Acting Insulin: Gen 1		Long-Acting Insulin: Gen 2		Rapid-Acting Insulin		Mixed Insulin	
		Pens	Vials	Pens	Vials	Pens	Vials	Pens	Vials
Allentown	29.0%	16.6%	3.0%	3.4%	10.1%	5.6%	1.3%	1.1%	
Harrisburg	30.2	18.8	3.1	3.4	10.7	4.4	1.5	0.5	
Reading	28.4	16.8	2.5	4.2	10.7	5.3	1.0	1.0	
Scranton	28.6	12.7	5.2	4.8	10.2	8.3	1.6	0.8	
Pennsylvania	32.0	18.2	4.2	3.8	12.4	6.3	2.2	1.0	
NATION	30.0%	16.1%	5.3%	4.0%	10.0%	6.3%	1.5%	1.0%	

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS RECEIVING VARIOUS NON-INSULIN ANTI-DIABETIC THERAPIES, 2015-2016^{1,2}

MARKET	Any Non-Insulin Antidiabetic Product		Biguanides		DPP-4 Inhibitors		GLP-1 Receptor Agonists		Insulin Sensitizing Agents		SGLT-2 Inhibitors		GLP-1 + Long-Acting Insulin	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Allentown	86.0%	86.6%	56.5%	57.8%	12.5%	12.6%	6.0%	7.7%	2.7%	2.7%	13.1%	14.1%	1.9%	2.8%
Harrisburg	86.4	86.5	60.2	60.0	11.3	11.6	6.5	7.9	3.6	4.4	10.4	11.3	2.1	2.5
Reading	86.6	87.6	60.4	60.3	11.3	12.6	4.8	6.7	2.9	2.4	14.9	14.6	1.3	2.2
Scranton	83.8	85.8	61.3	61.2	12.9	12.6	5.8	7.0	3.6	4.0	10.3	14.5	2.0	2.0
Pennsylvania	83.8	85.2	58.3	60.6	12.1	12.4	6.8	8.9	3.6	3.5	10.0	11.3	2.0	2.7
NATION	86.8%	87.5%	62.6%	64.0%	11.2%	11.1%	8.6%	10.1%	4.8%	5.0%	11.2%	11.7%	2.6%	3.1%

Data source: QuintilesIMS © 2017

¹ Patients who filled prescriptions for any insulin products may have also filled prescriptions for products in the non-insulin category, and vice versa.

² Includes HMOs, PPOs, point-of-service plans, and exclusive provider organizations.

NOTE: Throughout this report, "Gen 1" refers to those long-acting insulins that were approved through 2014, and "Gen 2" refers to those approved in 2015 or after. Gen 2 therapies are available as pens only.

Biguanides

Improve insulin sensitivity; reduce the production of glucose by the liver, decrease intestinal absorption of glucose, and increase the peripheral uptake and use of circulating glucose.

Dipeptidyl Peptidase 4 (DPP-4) Inhibitors

Inhibit DPP-4 enzymes and slow inactivation of incretin hormones, helping to regulate glucose homeostasis through increased insulin release and decreased glucagon levels.

GLP-1 Receptor Agonists

Used in conjunction with oral agents; increase glucose-dependent insulin secretion and pancreatic beta-cell sensitivity, reduce glucagon production, slow rate of absorption of glucose in the digestive tract by slowing gastric emptying, and suppress appetite.

Insulin Sensitizing Agents

Increase insulin sensitivity by improving response to insulin in liver, adipose tissue and skeletal muscle, resulting in decreased production of glucose by the liver and increased peripheral uptake and use of circulating glucose.

Sodium/Glucose Cotransporter 2 (SGLT-2) Inhibitors

Lowers blood glucose concentration so that glucose is excreted instead of reabsorbed.

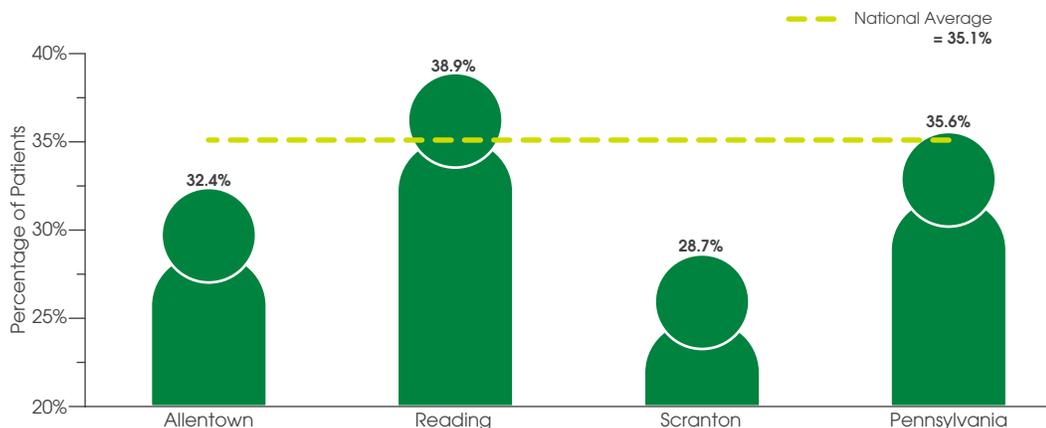
PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS RECEIVING VARIOUS THERAPIES, 2015–2016¹

MARKET	Use of 1 Product		Use of 2 Products				Use of 3 Products							
	Use of 1 Non-Insulin Product		Use of 2 Non-Insulin Products		Use of 2 Products: 1 Insulin, 1 Non-Insulin		Use of 2 Insulin Products		Use of 3 Non-Insulin Products		Use of 3 Products: 1 Insulin, 2 Non-Insulins		Use of 3 Products: 2 Insulins, 1 Non-Insulin	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Allentown	39.1%	38.9%	19.3%	19.5%	4.8%	4.6%	5.5%	4.8%	9.7%	10.1%	6.5%	7.0%	6.4%	6.0%
Harrisburg	37.6	36.3	20.8	21.6	5.7	4.9	6.3	4.7	8.6	9.8	6.4	6.4	6.6	7.8
Reading	39.9	39.9	21.3	20.1	3.8	4.5	6.3	5.1	9.9	9.8	5.0	6.2	6.1	6.7
Scranton	36.0	35.3	20.5	22.2	3.6	3.7	7.3	6.3	11.1	12.2	5.2	5.1	7.0	6.3
Pennsylvania	37.2	36.3	19.5	20.0	5.1	4.7	7.2	6.5	9.2	10.2	6.0	6.3	6.6	7.0
NATION	38.0%	38.1%	20.2%	20.2%	4.8%	4.7%	5.5%	5.2%	9.9%	10.3%	6.7%	6.7%	6.6%	6.5%

AVERAGE ANNUAL PAYMENTS PER COMMERCIAL TYPE 2 DIABETES PATIENT RECEIVING VARIOUS THERAPIES, 2015–2016^{1,2}

MARKET	Use of 1 Product		Use of 2 Products				Use of 3 Products							
	Use of 1 Non-Insulin Product		Use of 2 Non-Insulin Products		Use of 2 Products: 1 Insulin, 1 Non-Insulin		Use of 2 Insulin Products		Use of 3 Non-Insulin Products		Use of 3 Products: 1 Insulin, 2 Non-Insulins		Use of 3 Products: 2 Insulins, 1 Non-Insulin	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Allentown	\$536	\$587	\$1,498	\$1,841	\$2,692	\$2,975	\$4,167	\$4,683	\$3,424	\$3,615	\$4,671	\$5,687	\$5,726	\$7,683
Harrisburg	365	445	1,213	1,507	2,279	3,535	4,328	4,396	2,580	3,399	3,897	4,502	5,331	6,495
Reading	505	637	1,563	1,883	2,881	3,007	3,925	5,024	3,376	3,701	4,121	5,319	5,356	6,833
Scranton	363	466	1,279	1,590	2,948	3,330	4,687	5,253	3,296	3,957	4,167	5,184	5,827	7,069
Pennsylvania	381	487	1,225	1,639	2,588	3,322	4,112	5,057	2,989	3,896	4,038	5,132	5,436	6,774
NATION	\$393	\$451	\$1,336	\$1,612	\$3,056	\$3,362	\$4,605	\$5,045	\$3,270	\$3,842	\$4,705	\$5,356	\$6,192	\$6,939

PERCENTAGE OF COMMERCIAL TYPE 2 DIABETES PATIENTS RECEIVING ANY INSULIN PRODUCTS, A1c LEVEL >9.0%, 2016^{1,3,4}



PA TYPE 2 DIABETES PTS. FILLING INSULIN ARE MORE APT TO HAVE A1c >9.0% THAN U.S. PATIENTS

Of Type 2 diabetes patients receiving any insulin products, the shares of such patients with an A1c level above 9.0% in Reading (38.9%) and across Pennsylvania (35.6%) topped the national average (35.1%) in 2016. At 28.7%, Scranton recorded the lowest such percentage among the profiled markets.

Data source: QuintilesIMS © 2017

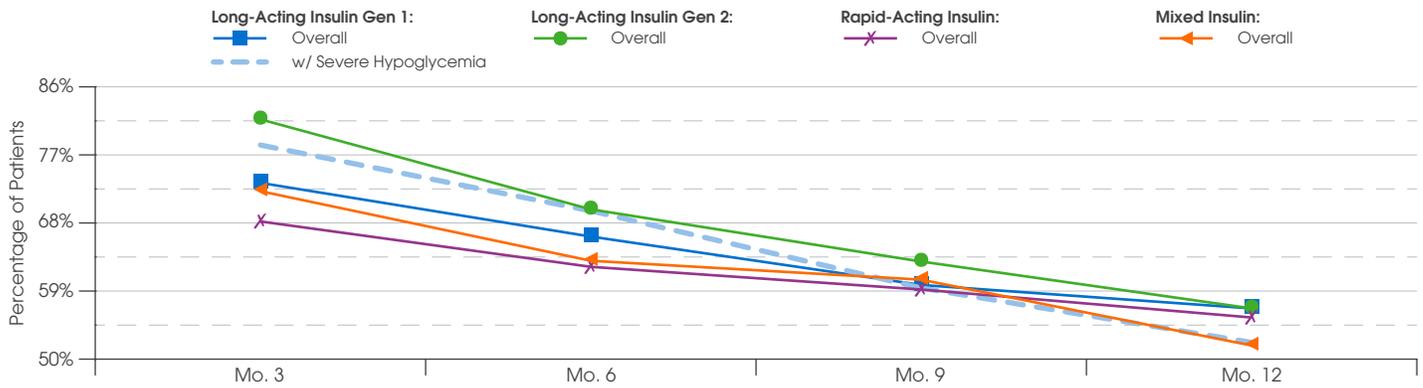
¹ Includes HMOs, PPOs, point-of-service plans, and exclusive provider organizations.

² Figures reflect the per-patient yearly costs for Type 2 diabetes patients receiving a particular type of therapy.

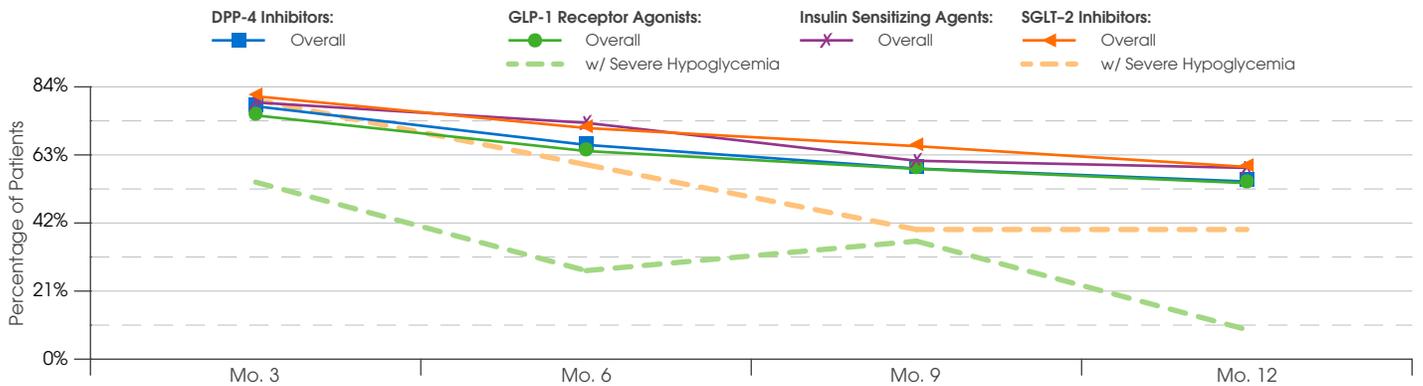
³ The A1c test measures the amount of glucose present in the blood during the past 2–3 months. Figures reflect the percentage of Type 2 diabetes patients who have had at least one A1c test in a given year.

⁴ Patients who filled prescriptions for any insulin products may have also filled prescriptions for products in the non-insulin category, and vice versa.

PERSISTENCY: COMMERCIAL TYPE 2 DIABETES PATIENTS OVERALL VS. COMMERCIAL TYPE 2 DIABETES PATIENTS WITH A COMPLICATION OF SEVERE HYPOGLYCEMIA, VARIOUS INSULIN THERAPIES, PENNSYLVANIA, 2016^{1,2}



PERSISTENCY: COMMERCIAL TYPE 2 DIABETES PATIENTS OVERALL VS. COMMERCIAL TYPE 2 DIABETES PATIENTS WITH A COMPLICATION OF SEVERE HYPOGLYCEMIA, VARIOUS NON-INSULIN ANTIDIABETIC THERAPIES, PENNSYLVANIA, 2016^{1,2}



HIGH SHARES OF PA TYPE 2 DIABETES PATIENTS FILLING THREE NON-INSULINS VISIT ED

From 2014 to 2016, the share of unique Pennsylvania Type 2 diabetes patients who filled prescriptions for three non-insulin antidiabetic products and had at least one emergency department (ED) visit (19.8%) exceeded that of their counterparts who were dispensed any insulin products (13.4%).

EMERGENCY DEPARTMENT (ED) UTILIZATION FOR PATIENTS DIAGNOSED WITH TYPE 2 DIABETES, BY TYPE OF THERAPY, 2014–2016^{3,4}

MARKET	Any Insulin Products		Three Non-Insulin Antidiabetic Products	
	Percentage of Unique Patients With at Least One ED Visit	ED Visits per Patient	Percentage of Unique Patients With at Least One ED Visit	ED Visits per Patient
Pennsylvania	13.4%	2.1	19.8%	2.6
Northeast Region ⁵	18.5	2.2	25.3	2.6
NATION	20.9%	2.1	25.7%	2.6

PROFESSIONAL ED CHARGES FOR COMMERCIAL TYPE 2 DIABETES PATIENTS, OVERALL VS. COMMERCIAL TYPE 2 DIABETES PATIENTS WITH A COMPLICATION OF STROKE, 2016^{1,2,6}

MARKET	Overall	w/ Stroke
Allentown	\$1,044	\$1,122
Harrisburg	1,323	1,579
Reading	1,000	1,741
Scranton	1,092	1,601
Pennsylvania	986	1,337
NATION	\$1,486	\$2,174

Data source: QuintilesIMS © 2017

¹ Includes HMOs, PPOs, point-of-service plans, and exclusive provider organizations.

² A complication is defined as a patient condition caused by the Type 2 diabetes of the patient. These conditions are a direct result of having Type 2 diabetes. Complications of Type 2 diabetes include, but are not limited to, acute myocardial infarction (AMI), cardiovascular (CV) disease, severe hypoglycemia, nephropathy, neuropathy, peripheral artery disease (PAD), and retinopathy.

³ Figures reflect the percentages of and the visits and charges for Type 2 diabetes patients who visited an emergency department in the three-year period between 2014 and 2016. These include patients who filled multiple prescriptions.

⁴ Patients who filled prescriptions for any insulin products may have also filled prescriptions for products in the non-insulin category, and vice versa.

⁵ The Northeast region includes Connecticut, Massachusetts, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

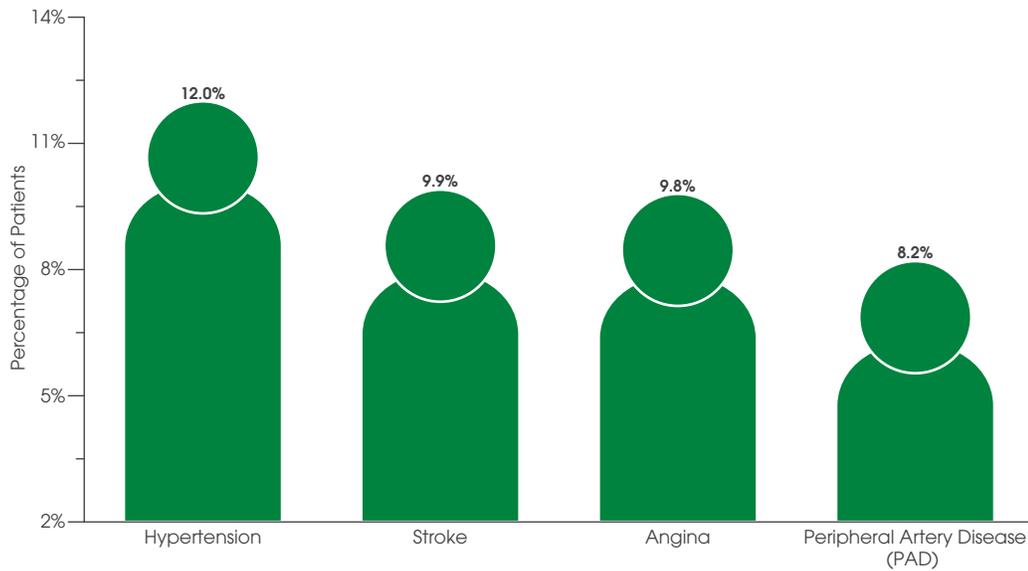
⁶ Professional charges are those generated by the providers delivering care to Type 2 diabetes patients in various settings.

NOTE: "Persistence" measures whether patients maintain their prescribed therapy. It is calculated by identifying patients who filled a prescription for the reported drug class in the six months prior to the reported year, and then tracking prescription fills for those same patients in each of the months in the current reported year. If patients fill a prescription in a month, they are reported among the patients who have continued or restarted on therapy. Continued means that the patient has filled the drug group in each of the preceding months. Restarted means that the patient did not fill in one or more of the preceding months. Continuing and restarting patients are reported together. Some data were unavailable for Pennsylvania.

DIABETES & CARDIOVASCULAR DISEASE



PERCENTAGE OF INPATIENTS WITH A SECONDARY DIAGNOSIS OF DIABETES MELLITUS, BY FOUR PRIMARY CARDIOVASCULAR DIAGNOSES, PENNSYLVANIA, 2015



OP CHARGES FOR ALLENTOWN TYPE 2 DIABETES PTS. WITH CV DISEASE ARE HIGH VERSUS PA

Allentown Type 2 diabetes patients with a complication of cardiovascular disease recorded average outpatient (OP) facility charges (\$25,514) that were 132.5% higher than the Pennsylvania mean (\$10,973) that year, and 156.6% higher than those of Allentown Type 2 diabetes patients overall (\$9,942) in 2016.

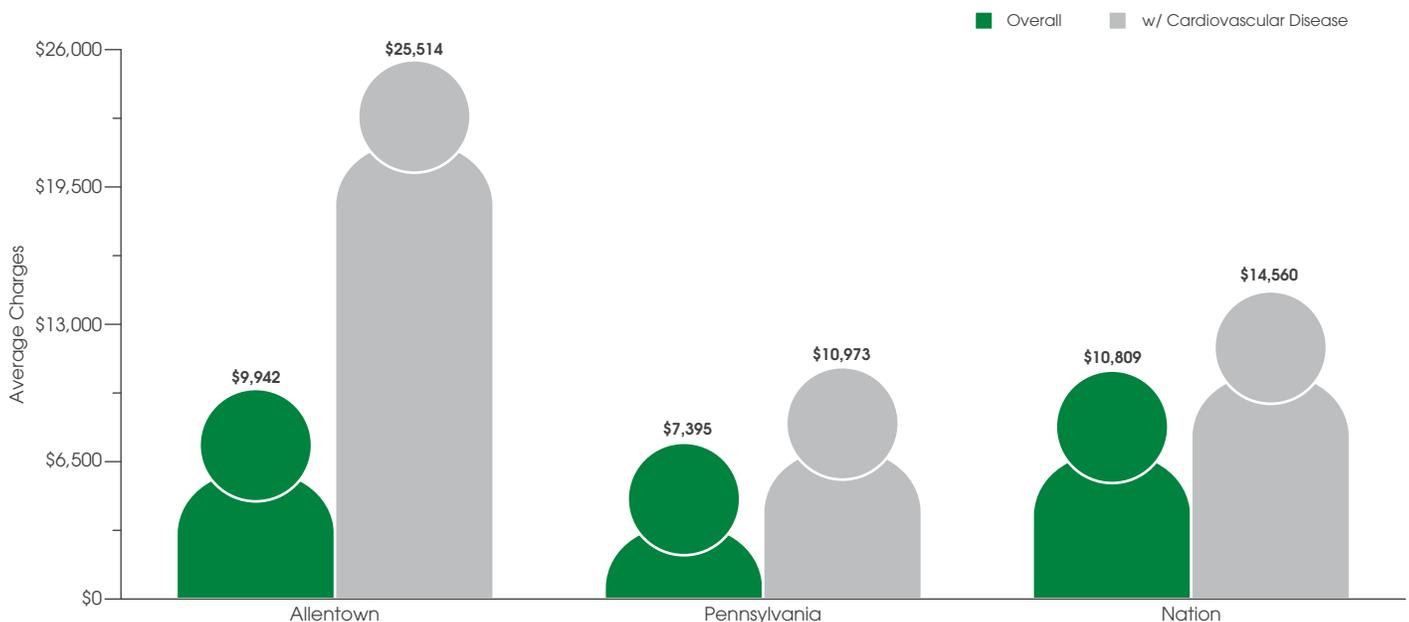
NEARLY 10% OF PA STROKE, ANGINA IPs ALSO HAVE A DIABETES MELLITUS DX

In 2015, 9.9% of Pennsylvania stroke inpatient (IP) cases and 9.8% of angina IP cases across the Commonwealth also had a secondary diagnosis of diabetes mellitus. For such PAD cases, this share was 8.2% that year.

INPATIENT FACILITY CHARGES PER YEAR FOR TYPE 2 DIABETES PATIENTS WITH A COMPLICATION OF CARDIOVASCULAR DISEASE, 2015-2016^{1,2}

MARKET	2015	2016
Allentown	\$46,057	n/a
Scranton	39,991	n/a
Pennsylvania	42,237	\$35,784
NATION	\$42,132	\$43,790

OUTPATIENT FACILITY CHARGES PER YEAR FOR TYPE 2 DIABETES PATIENTS OVERALL VS. TYPE 2 DIABETES PATIENTS WITH A COMPLICATION OF CARDIOVASCULAR DISEASE, 2016^{1,2}



Data source: QuintilesIMS © 2017

¹ Figures reflect the charges generated by the facilities that delivered care. The data also reflect the amounts charged, not the amounts paid.

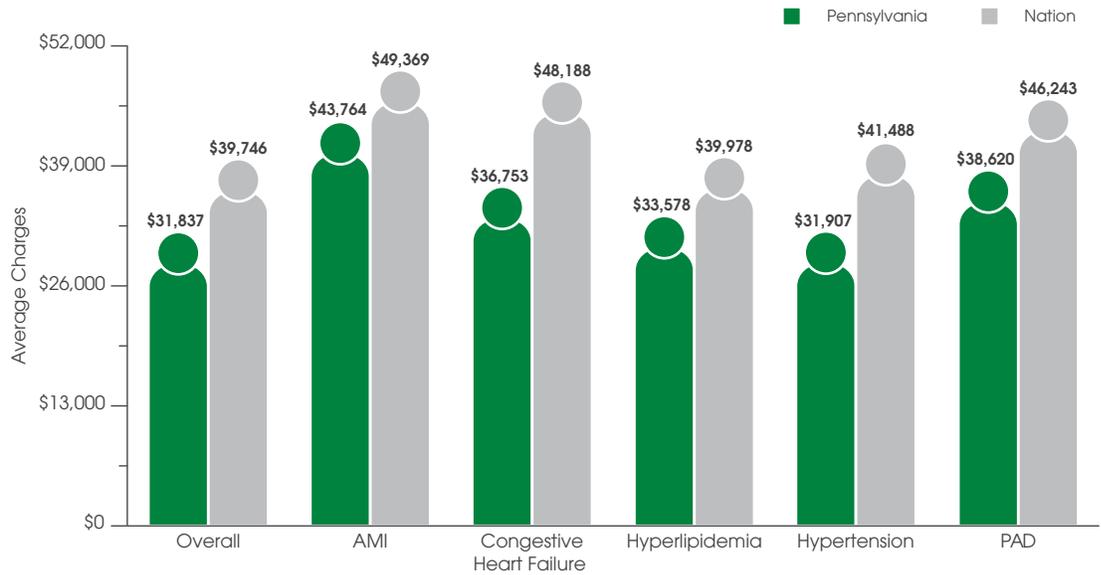
² A complication is defined as a patient condition caused by the Type 2 diabetes of the patient. These conditions are a direct result of having Type 2 diabetes. Complications of Type 2 diabetes include, but are not limited to, acute myocardial infarction (AMI), cardiovascular (CV) disease, severe hypoglycemia, nephropathy, neuropathy, peripheral artery disease (PAD), and retinopathy.

NOTE: Secondary diagnoses and procedures data come from QuintilesIMS's Hospital Procedure/Diagnosis (HPD) database and are current as of calendar year 2015. Some data were unavailable for the selected markets. Throughout this report, n/a indicates that data were not available.

CO-OCCURRING DIAGNOSES DRIVE UP IP CHARGES FOR PA TYPE 2 DIABETES PATIENTS

In 2016, inpatient (IP) facility charges per Pennsylvania Type 2 diabetes patient with any of the five common co-occurring conditions shown surpassed those of Pennsylvania Type 2 diabetes patients overall (\$31,837). For example, such charges for Pennsylvania Type 2 diabetes patients with AMI (\$43,764) exceeded those for Type 2 diabetes patients overall in Pennsylvania by 37.5%. Outpatient facility charges per Pennsylvania Type 2 diabetes patient with a co-occurring condition of AMI (\$11,190), congestive heart failure (\$12,554), or PAD (\$10,695) topped those for Pennsylvania Type 2 diabetes patients overall (\$7,395) by at least 44%.

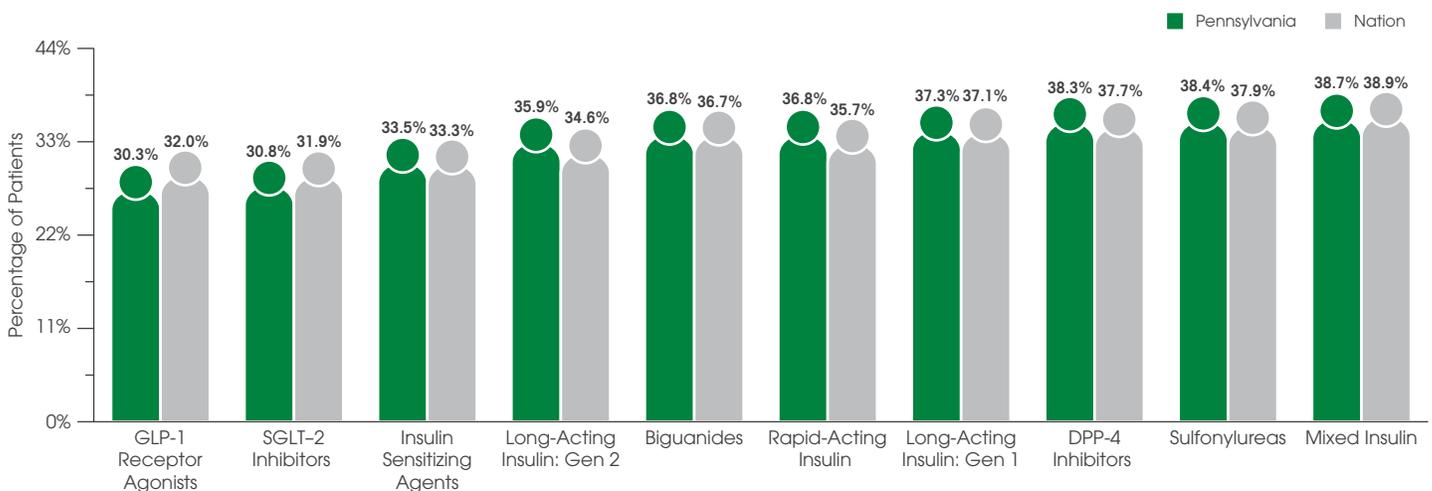
INPATIENT FACILITY CHARGES PER YEAR FOR TYPE 2 DIABETES PATIENTS WITH COMMON CO-OCCURRING CONDITIONS, 2016^{1,2}



OUTPATIENT FACILITY CHARGES PER YEAR FOR TYPE 2 DIABETES PATIENTS WITH COMMON CO-OCCURRING CONDITIONS, 2016^{1,2}

MARKET	Overall	AMI	Congestive Heart Failure	Hyperlipidemia	Hypertension	PAD
Pennsylvania	\$7,395	\$11,190	\$12,554	\$7,260	\$8,209	\$10,695
NATION	\$10,809	\$17,264	\$16,196	\$10,463	\$11,749	\$15,168

PERCENTAGE OF TYPE 2 DIABETES PATIENTS WITH A COMPLICATION OF CARDIOVASCULAR DISEASE, BY THERAPY, 2016³



Data source: QuintilesIMS © 2017

¹ Figures reflect the charges generated by the facilities that delivered care. The data also reflect the amounts charged, not the amounts paid.

² Common co-occurring conditions include both complications and comorbidities. A complication is defined as a patient condition caused by the Type 2 diabetes of the patient. A comorbidity is a condition a Type 2 diabetes patient may also have. Complications of Type 2 diabetes include, but are not limited to, acute myocardial infarction (AMI), cardiovascular (CV) disease, nephropathy, neuropathy, peripheral artery disease (PAD), retinopathy, severe hypoglycemia, and stroke. Comorbidities include, but are not limited to, depression, hyperlipidemia, hypertension, obesity, and pneumonia.

³ A complication is defined as a patient condition caused by the Type 2 diabetes of the patient. These conditions are a direct result of having Type 2 diabetes. Complications of Type 2 diabetes include, but are not limited to, acute myocardial infarction (AMI), cardiovascular (CV) disease, severe hypoglycemia, nephropathy, neuropathy, peripheral artery disease (PAD), and retinopathy.

NOTE: Some data were unavailable for the selected markets.

ACS/STROKE



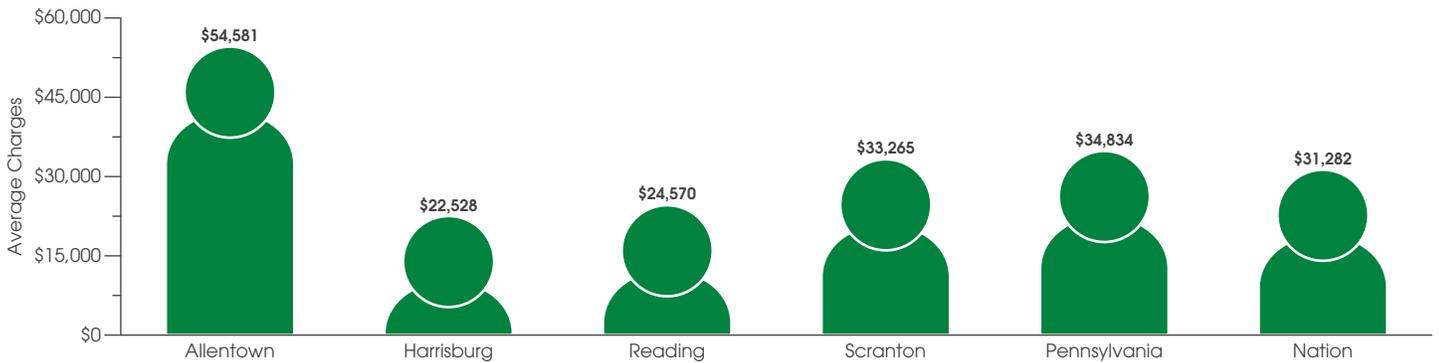
AVERAGE LENGTH OF STAY (DAYS) AND CHARGES PER INPATIENT ACUTE CORONARY SYNDROMES CASE, 2015

MARKET	Average Length of Stay	Average Charges ¹
Allentown	2.5	\$54,581
Harrisburg	1.9	22,528
Reading	1.6	24,570
Scranton	1.8	33,265
Pennsylvania	2.0	34,834
NATION	2.1	\$31,282

INPATIENT CHARGES PER PENNSYLVANIA ACS CASE EXCEED NATIONAL MARK

Inpatient (IP) charges per acute coronary syndromes (ACS) case in Allentown (\$54,581), Scranton (\$33,265), and Pennsylvania (\$34,834) were higher than those of the nation (\$31,282) in 2015.

CHARGES PER INPATIENT ACUTE CORONARY SYNDROMES CASE, 2015¹



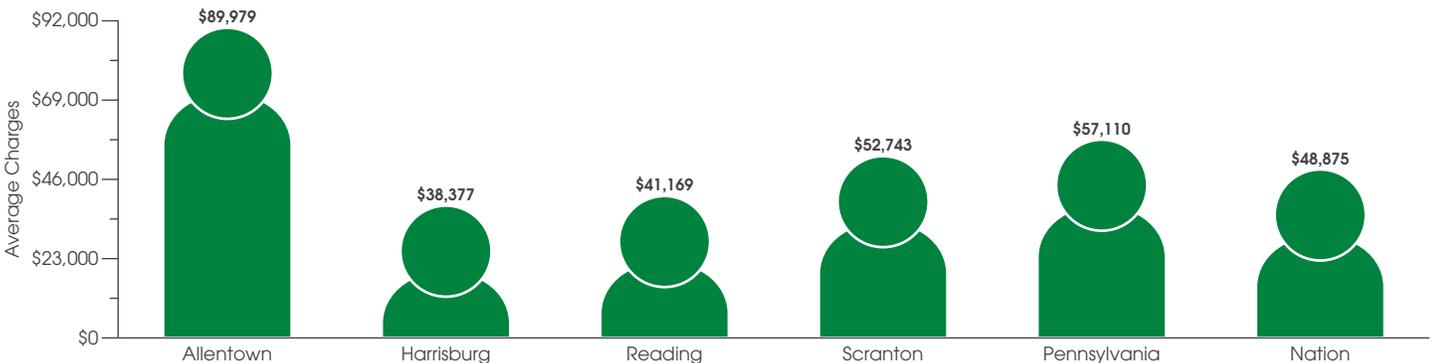
AVERAGE LENGTH OF STAY (DAYS) AND CHARGES PER INPATIENT STROKE CASE, 2015

MARKET	Average Length of Stay	Average Charges ¹
Allentown	3.8	\$89,979
Harrisburg	4.3	38,377
Reading	3.8	41,169
Scranton	4.0	52,743
Pennsylvania	3.8	57,110
NATION	4.1	\$48,875

ALLENTOWN, SCRANTON, PA ALSO RECORD HIGH IP CHARGES FOR STROKE

In Allentown (\$89,979), Scranton (\$52,743), and across Pennsylvania (\$57,110) inpatient charges per stroke case also exceeded the corresponding national mark (\$48,875) in 2015.

CHARGES PER INPATIENT STROKE CASE, 2015¹



Data source: QuintilesIMS © 2017

¹ Charge data are per-case averages for inpatients with a particular diagnosis of interest. Charges may be for treatment related to other diagnoses. Data reflect the total charges billed by the hospital for the entire episode of care, and may include accommodation, pharmacy, laboratory, radiology, and other charges not billed by the physician. Data do not necessarily indicate final amounts paid.

NOTE: Average length of stay (ALOS) and hospital inpatient charge data come from QuintilesIMS's Hospital Procedure/Diagnosis (HPD) database and are current as of calendar year 2015.

NUMBERS OF INPATIENT AND OUTPATIENT DIABETES MELLITUS CASES PER HOSPITAL, 2014-2015

MARKET	Inpatient Cases		Outpatient Cases	
	2014	2015	2014	2015
Allentown	1,644.8	1,779.1	13,498.9	12,555.6
Harrisburg	2,611.3	2,689.4	29,431.3	32,029.3
Reading	2,517.0	2,515.3	17,658.3	17,989.0
Scranton	1,991.3	2,019.7	14,770.6	16,772.0
Pennsylvania	1,662.1	1,671.3	10,485.0	10,700.0
NATION	1,227.9	1,272.8	6,363.7	6,865.5

NUMBERS OF INPATIENT AND OUTPATIENT DIABETES MELLITUS CASES PER HOSPITAL, BY PAYER, 2015

MARKET	Inpatient Cases				Outpatient Cases	
	Medicare	Medicaid	Third Party	Other	Medicare	Non-Medicare
Allentown	1,207.0	179.5	346.6	46.0	4,828.3	7,727.3
Harrisburg	1,858.8	295.8	725.0	181.6	9,548.3	22,481.0
Reading	1,635.7	287.3	529.7	62.7	8,333.7	9,655.3
Scranton	1,432.0	198.4	313.9	75.4	8,187.9	8,584.1
Pennsylvania	1,102.1	210.4	346.3	52.7	4,524.7	6,494.3
NATION	807.8	166.9	268.0	96.9	3,402.5	3,704.1

AVERAGE LENGTH OF STAY (DAYS) AND CHARGES PER INPATIENT DIABETES MELLITUS CASE, 2014-2015

MARKET	Average Length of Stay (Days)		Average Charges ¹	
	2014	2015	2014	2015
Allentown	4.3	4.1	\$72,020	\$64,700
Harrisburg	4.4	4.5	30,875	27,793
Reading	5.1	5.2	46,455	36,528
Scranton	4.9	5.1	47,564	48,333
Pennsylvania	4.3	4.4	51,941	46,721
NATION	4.1	4.0	\$43,939	\$38,984

DISTRIBUTION OF OUTPATIENT DIABETES MELLITUS CASES, BY SETTING, 2015

MARKET	Emergency Department	Ambulatory Surgery	All Other Outpatient Cases ²
Allentown	18.6%	14.2%	67.2%
Harrisburg	14.0	17.5	68.6
Reading	23.6	6.8	69.6
Scranton	20.1	12.4	67.5
Pennsylvania	21.3	12.3	66.4
NATION	28.2%	14.8%	57.0%

Data source: QuintilesIMS © 2017

¹ Figures reflect the charges generated by the facilities that delivered care. The data also reflect the amounts charged, not the amounts paid.

² "All Other Outpatient Cases" includes cases treated in units that provide outpatient medical care by appointment, such as general, obstetric, pediatric, substance abuse, or psychiatric clinics.

NOTE: Average length of stay (ALOS) and hospital inpatient and outpatient data come from QuintilesIMS's Hospital Procedure/Diagnosis (HPD) database and are current as of calendar year 2015.

ADDITIONAL INFORMATION



PROFESSIONAL CHARGES PER YEAR FOR COMMERCIAL TYPE 2 DIABETES PATIENTS, BY SETTING, 2015-2016^{1,2}

MARKET	Ambulatory Surgery		Emergency Department		Hospital Inpatient		Hospital Outpatient		Office/Clinic	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Allentown	\$2,264	\$2,172	\$965	\$1,044	\$2,530	\$2,957	\$1,247	\$1,341	\$1,269	\$1,482
Harrisburg	1,645	1,854	1,009	1,323	2,949	2,972	1,084	1,281	1,528	1,612
Reading	2,403	2,106	856	1,000	4,660	4,839	1,000	1,068	1,754	2,003
Scranton	2,423	2,746	873	1,092	2,442	2,920	890	951	1,449	1,625
Pennsylvania	2,090	2,184	884	986	2,590	2,969	1,009	1,078	1,413	1,598
NATION	\$2,403	\$2,569	\$1,283	\$1,486	\$3,081	\$3,323	\$1,243	\$1,325	\$1,886	\$2,049

PROFESSIONAL INPATIENT CHARGES PER YEAR FOR TYPE 2 DIABETES PATIENTS, BY PAYER, 2015-2016¹

MARKET	Commercial Insurance ²		Medicare		Medicaid	
	2015	2016	2015	2016	2015	2016
Allentown	\$2,530	\$2,961	\$1,356	\$1,693	\$2,524	\$2,848
Harrisburg	2,949	2,971	2,184	2,375	3,104	3,305
Reading	4,660	4,837	4,520	5,131	4,102	4,461
Scranton	2,442	2,917	1,718	1,940	2,818	3,163
Pennsylvania	2,590	2,969	2,526	2,785	3,718	4,008
NATION	\$3,082	\$3,323	\$2,630	\$2,856	\$3,325	\$3,606

PROFESSIONAL INPATIENT CHARGES PER YEAR FOR COMMERCIAL TYPE 2 DIABETES PATIENTS, OVERALL VS. COMMERCIAL TYPE 2 DIABETES PATIENTS WITH A COMPLICATION OF SEVERE HYPOGLYCEMIA, 2016^{1,2,3}

MARKET	Overall	w/ Severe Hypoglycemia
Allentown	\$2,957	\$5,708
Harrisburg	2,972	4,946
Reading	4,839	8,290
Scranton	2,920	5,217
Pennsylvania	2,969	5,019
NATION	\$3,323	\$5,472

PROFESSIONAL INPATIENT CHARGES PER YEAR FOR COMMERCIAL TYPE 2 DIABETES PATIENTS, BY ACTUAL COMPLICATION, 2016^{1,2,3}

MARKET	Cardiovascular Disease	Nephropathy	Neuropathy	PAD	Retinopathy
Allentown	\$3,890	\$4,329	\$4,191	\$4,632	\$3,453
Harrisburg	4,088	3,953	4,010	4,669	2,950
Reading	5,904	6,789	6,337	7,250	5,964
Scranton	3,683	4,091	3,750	3,879	3,549
Pennsylvania	3,918	4,216	3,924	4,304	3,412
NATION	\$4,301	\$4,692	\$4,456	\$5,006	\$4,050

Data source: QuintilesIMS © 2017

¹ Professional charges are those generated by the providers delivering care to Type 2 diabetes patients in various settings.

² Includes HMOs, PPOs, point-of-service plans, and exclusive provider organizations.

³ A complication is defined as a patient condition caused by the Type 2 diabetes of the patient. These conditions are a direct result of having Type 2 diabetes. Complications of Type 2 diabetes include, but are not limited to, acute myocardial infarction (AMI), cardiovascular (CV) disease, severe hypoglycemia, nephropathy, neuropathy, peripheral artery disease (PAD), and retinopathy.

AVERAGE ANNUAL PAYMENTS PER TYPE 2 DIABETES PATIENT RECEIVING VARIOUS INSULIN THERAPIES, BY PAYER TYPE, 2016^{1,2}

MARKET	Any Insulin Products			Long-Acting Insulin: Gen 1			Long-Acting Insulin: Gen 2			Rapid-Acting Insulin			Mixed Insulin		
	Comm. Ins. ³	Medi-care	Medi-aid	Comm. Ins. ³	Medi-care	Medi-aid	Comm. Ins. ³	Medi-care	Medi-aid	Comm. Ins. ³	Medi-care	Medi-aid	Comm. Ins. ³	Medi-care	Medi-aid
Allentown	\$3,807	\$4,034	\$4,700	\$2,554	\$2,671	\$2,564	\$2,309	\$2,219	\$2,265	\$2,883	\$2,734	\$3,720	\$2,803	\$3,905	\$4,129
Harrisburg	3,803	4,787	5,154	2,364	3,062	2,788	2,347	2,472	2,149	2,985	3,037	3,418	4,340	4,502	3,326
Reading	3,825	4,264	4,263	2,091	2,485	2,070	2,295	1,991	2,036	3,306	2,872	2,987	3,158	4,063	2,692
Scranton	4,521	4,402	4,942	2,317	2,486	2,505	2,514	2,366	2,698	3,521	3,022	3,480	4,235	4,339	4,874
Pennsylvania	4,102	4,031	4,533	2,346	2,519	2,461	2,137	2,147	2,121	3,133	2,670	3,123	3,767	3,745	3,353
NATION	\$4,045	\$3,798	\$4,128	\$2,483	\$2,553	\$2,436	\$2,301	\$2,107	\$2,060	\$3,144	\$2,561	\$2,814	\$3,319	\$3,248	\$2,952

AVERAGE ANNUAL PAYMENTS PER COMMERCIAL TYPE 2 DIABETES PATIENT RECEIVING VARIOUS INSULIN THERAPIES, PENS VS. VIALS, 2016^{1,3}

MARKET	Long-Acting Insulin: Gen 1		Long-Acting Insulin: Gen 2		Rapid-Acting Insulin		Mixed Insulin	
	Pens	Vials	Pens	Vials	Pens	Vials	Pens	Vials
Allentown	\$2,603	\$1,932	\$2,345	\$2,401	\$3,419	\$3,215	\$2,331	
Harrisburg	2,367	2,251	2,387	2,512	3,871	4,634	3,502	
Reading	2,049	2,273	2,287	2,874	3,756	3,150	2,952	
Scranton	2,223	2,434	2,516	2,962	3,933	4,282	3,859	
Pennsylvania	2,292	2,281	2,143	2,625	3,706	4,146	2,620	
NATION	\$2,436	\$2,306	\$2,308	\$2,661	\$3,476	\$3,862	\$2,308	

AVERAGE ANNUAL PAYMENTS PER COMMERCIAL TYPE 2 DIABETES PATIENT RECEIVING VARIOUS NON-INSULIN ANTIDIABETIC THERAPIES, 2015-2016^{1,2,3}

MARKET	Any Non-Insulin Antidiabetic Product		DPP-4 Inhibitors		GLP-1 Receptor Agonists		Insulin Sensitizing Agents		SGLT-2 Inhibitors		GLP-1 + Long-Acting Insulin	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Allentown	\$1,345	\$1,630	\$2,355	\$2,401	\$3,285	\$3,898	\$254	\$277	\$2,225	\$2,683	\$2,587	\$3,041
Harrisburg	1,007	1,351	2,119	2,663	2,722	3,563	158	88	2,229	2,551	2,015	2,620
Reading	1,271	1,599	2,178	2,556	3,120	3,927	139	147	2,466	2,959	1,836	2,558
Scranton	1,203	1,559	2,325	2,627	3,479	3,878	221	182	2,405	2,821	2,546	2,759
Pennsylvania	1,086	1,498	2,125	2,534	2,893	3,880	168	140	2,100	2,710	2,083	2,654
NATION	\$1,222	\$1,469	\$2,213	\$2,420	\$3,194	\$3,764	\$139	\$109	\$2,163	\$2,550	\$2,358	\$2,659

Data source: QuintilesIMS © 2017

¹ Figures reflect the per-patient yearly payments for Type 2 diabetes patients receiving a particular type of therapy.

² Patients who filled prescriptions for any insulin products may have also filled prescriptions for products in the non-insulin category, and vice versa.

³ Includes HMOs, PPOs, point-of-service plans, and exclusive provider organizations.

NOTE: Throughout this report, "Gen 1" refers to those long-acting insulins that were approved through 2014, and "Gen 2" refers to those approved in 2015 or after. Gen 2 therapies are available as pens only.

Dipeptidyl Peptidase 4 (DPP-4) Inhibitors

Inhibit DPP-4 enzymes and slow inactivation of incretin hormones, helping to regulate glucose homeostasis through increased insulin release and decreased glucagon levels.

GLP-1 Receptor Agonists

Used in conjunction with oral agents; increase glucose-dependent insulin secretion and pancreatic beta-cell sensitivity, reduce glucagon production, slow rate of absorption of glucose in the digestive tract by slowing gastric emptying, and suppress appetite.

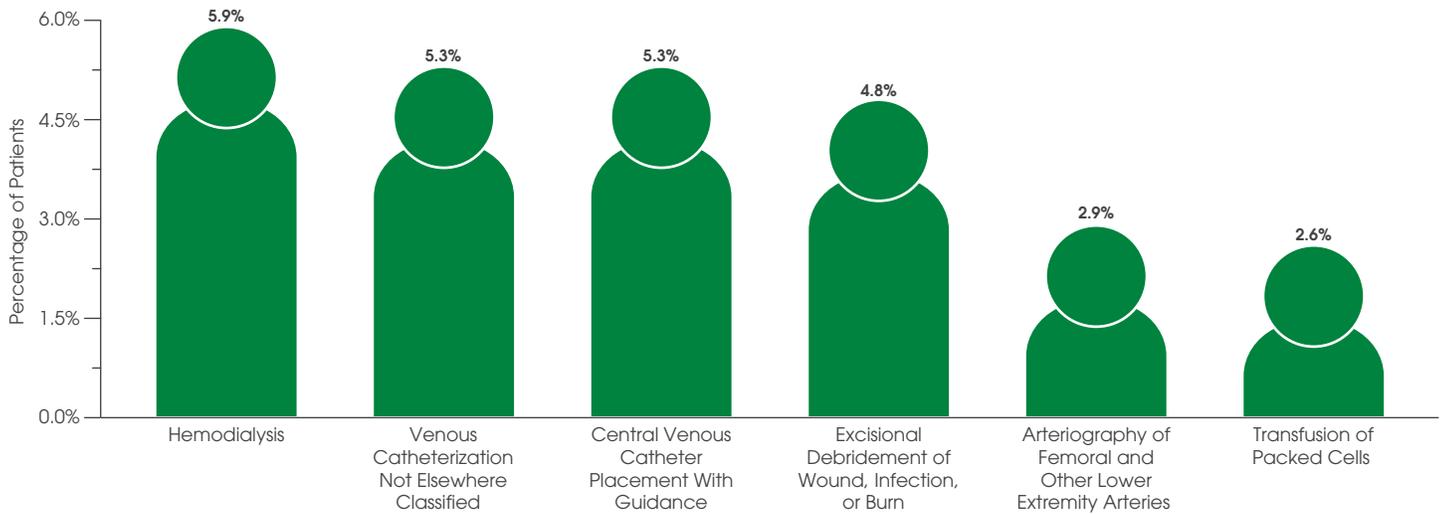
Insulin Sensitizing Agents

Increase insulin sensitivity by improving response to insulin in liver, adipose tissue and skeletal muscle, resulting in decreased production of glucose by the liver and increased peripheral uptake and use of circulating glucose.

Sodium/Glucose Cotransporter 2 (SGLT-2) Inhibitors

Lowers blood glucose concentration so that glucose is excreted instead of reabsorbed.

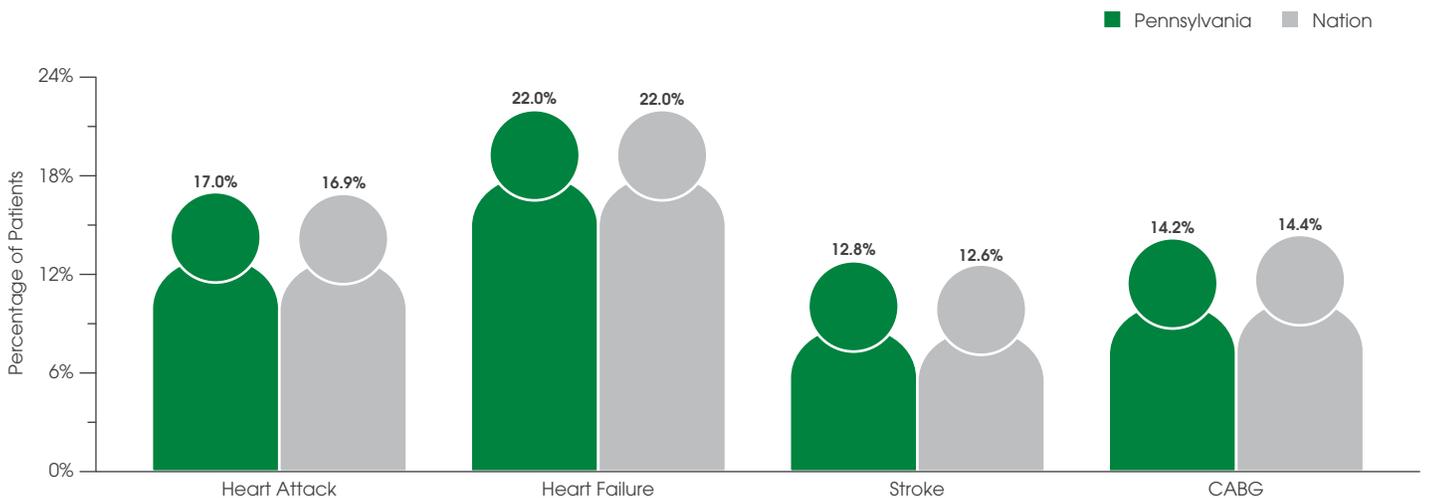
MOST COMMON PROCEDURES FOR PATIENTS WITH A PRIMARY DIAGNOSIS OF DIABETES MELLITUS, PENNSYLVANIA, 2015



READMISSION RATES FOR PATIENTS DIAGNOSED WITH TYPE 2 DIABETES, BY TYPE OF THERAPY, 2014-2016^{1,2}

MARKET	Three-Day Readmissions		30-Day Readmissions	
	Any Insulin Products	Three Non-Insulin Antidiabetic Products	Any Insulin Products	Three Non-Insulin Antidiabetic Products
Pennsylvania	8.4%	13.9%	18.7%	22.0%
Northeast Region ³	7.1%	11.7%	16.9%	22.0%
NATION	8.7%	11.9%	18.1%	22.4%

30-DAY READMISSION RATES FOR PATIENTS WITH SELECT CARDIOVASCULAR CONDITIONS, 2015



Data source: QuintilesIMS © 2017

¹ Figures reflect the percentages of Type 2 diabetes patients who were readmitted to an inpatient facility in the three-year period between 2014 and 2016. These percentages include patients who filled multiple prescriptions. Readmissions are not necessarily due to Type 2 diabetes.

² Patients who filled prescriptions for any insulin products may have also filled prescriptions for products in the non-insulin category, and vice versa.

³ The Northeast region includes Connecticut, Massachusetts, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

NOTE: Procedures data come from QuintilesIMS's Hospital Procedure/Diagnosis (HPD) database and are current as of calendar year 2015. CABG is coronary artery bypass graft.

Lehigh Valley Business Coalition on Healthcare
60 West Broad St., Ste. 105
Bethlehem, Pennsylvania 18018

Methodology

QuintilesIMS generated most of the data for this report out of health care professional (837p) and institutional (837i) insurance claims, representing nearly 9.7 million unique patients nationally in 2016 with a diagnosis of Type 2 diabetes (ICD-9 codes 249.00–250.92; ICD-10 codes E08, E09, E11, E13). Data from physicians of all specialties and from all hospital types are included.

QuintilesIMS also gathers data on prescription activity from the National Council for Prescription Drug Programs (NCPDP). These data account for some 2 billion prescription claims annually, or more than 86% of the prescription universe. These prescription data represent the sampling of prescription activity from a variety of sources, including retail chains, mass merchandisers, and pharmacy benefit managers. Cash, Medicaid, and third-party transactions are tracked.

DATA INTEGRITY

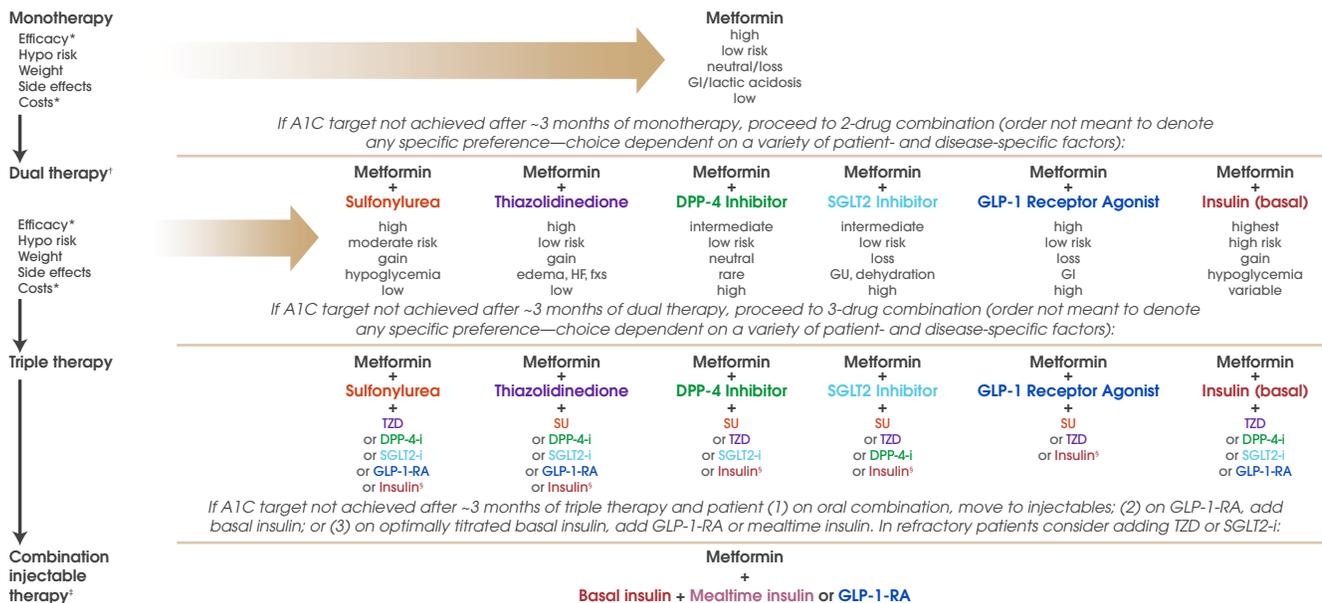
Data arriving into QuintilesIMS are put through a rigorous process to ensure that data elements match to valid references, such as product codes, ICD-9/10 (diagnosis) and CPT-4 (procedure) codes, and provider and facility data.

Claims undergo a careful de-duplication process to ensure that when multiple, voided, or adjusted claims are assigned to a patient encounter, they are applied to the database, but only for a single, unique patient.

Through its patient encryption methods, QuintilesIMS creates a unique, random numerical identifier for every patient, and then strips away all patient-specific health information that is protected under the Health Insurance Portability and Accountability Act (HIPAA). The identifier allows QuintilesIMS to track disease-specific diagnosis and procedure activity across the various settings where patient care is provided (hospital inpatient, hospital outpatient, emergency rooms, clinics, doctors' offices, and pharmacies), while protecting the privacy of each patient.

Adapted From the 2015 ADA/EASD Position Statement

Healthy eating, weight control, increased physical activity, and diabetes education



Antihyperglycemic therapy in Type 2 diabetes: general recommendations (see Reference). The order in the chart was determined by historical availability and the route of administration, with injectables to the right; it is not meant to denote any specific preference. Potential sequences of antihyperglycemic therapy for patients with Type 2 diabetes are displayed, with the usual transition moving vertically from top to bottom (although horizontal movement within therapy stages is also possible, depending on the circumstances). DPP-4-i, DPP-4 inhibitor; fxs, fractures; GI, gastrointestinal; GLP-1-RA, GLP-1 receptor agonist; GU, genitourinary; HF, heart failure; Hypo, hypoglycemia; SGLT2-i, SGLT2 inhibitor; SU, sulfonylurea; TZD, thiazolidinedione. *See Reference for description of efficacy categorization. † Consider starting at this stage when A1C is $\geq 9\%$. ‡ Consider starting at this stage when blood glucose is ≥ 300 – 350 mg/dL (16.7–19.4 mmol/L) and/or A1C is ≥ 10 – 12% , especially if symptomatic or catabolic features are present, in which case basal insulin + mealtime insulin is the preferred initial regimen. § Usually a basal insulin (NPH, glargine, detemir, degludec). Adapted with permission from Inzucchi et al. (see Reference).

Reference: Inzucchi, S. E., et al. (2015). Management of Hyperglycemia in Type 2 Diabetes, 2015: A Position Statement of the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). Diabetes Care. Retrieved from <http://care.diabetesjournals.org/content/38/1/140.full.pdf+html>