Montana
Chronic Disease Prevention
& Health Promotion Bureau

Chronic Disease Surveillance Report

December 2014

Emergency Department utilization among Montana adults with diabetes

Highlights

- In 2013, 7.7% of Montana residents aged 18 years and older had diabetes.[3]
- 42.1% of adults with diabetes also had diagnosis of hypertension at the ED visit.[4]
- 90.2% of adults complaining of chest pain during their ED visit were treated and released.[4]

For clinical recommendations see the last page.

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MONTANA DPHHS
Healthy People. Healthy Communities.
Department of Public Health & Human Services

The Burden of Diabetes

Diabetes is a major public health concern. From 2010 through 2012, the number of Americans living with diabetes increased from 25.8 million to 29.1 million.[1] In 2010, there were approximately 12.1 million (9.4%) diabetes-related emergency department (ED) visits for U.S. adults.[2]

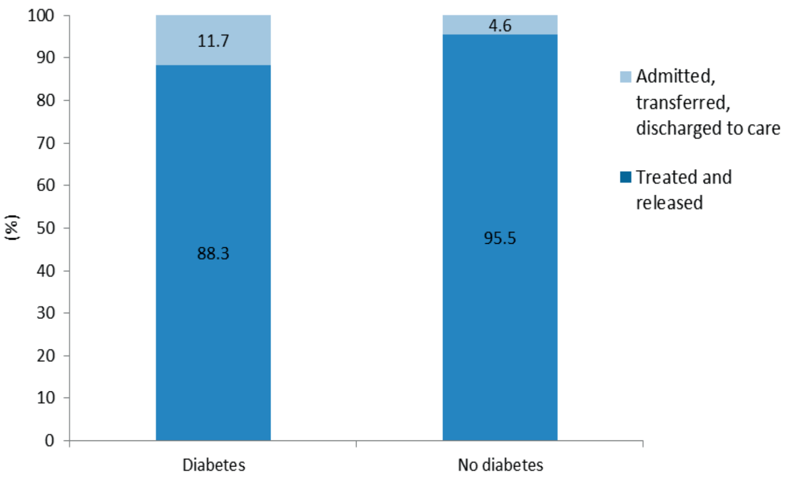
When people with diabetes lack access to primary care and their condition is not properly managed, then diabetes and its complications can lead to preventable admissions to the hospital or visits to the ED.

This report provides data on ED utilization for patients with diabetes aged 18 years and over from 2010 through 2012 in Montana.

Diabetes Discharge Status

Patients with diabetes are more often admitted, transferred, or discharged to additional care from the ED compared to patients without diabetes (Figure 1).

Figure 1. Percentage of diabetes-related emergency department visits, Montana residents aged 18 years and over, by discharge status, 2010-2012



Differences in Diagnosed Diabetes

Every year, about **4,500** Montanans are diagnosed with diabetes.[5]

From 2010 through 2012, there were 42,521 diabetes-related ED visits for Montana residents aged ≥18 years. Out of those, 3,913 (9.2%) visits had diabetes coded as the primary reason for the ED visit.

- Adults aged 65 years and over had the highest proportion of diabetes-related ED visits and almost five times the rate for being admitted, transferred, or discharged to care for further treatment when compared to adults aged 45 to 64 years (Table 1).
- Females accounted for 53% of all diabetes-related ED visits.
- Patients living in urban areas had the highest rate of diabetes-related ED visits and had the highest rate of treated and released patients.
- Patients residing in frontier areas had the highest rate of being admitted compared to patients from rural and urban areas.

Table 1. Diabetes-related emergency department visits, Montana residents aged 18 years and over, 2010-2012

Characteristics	All diabetes-related ED visits N=42,521		Treated and released n=37,533		Admitted, transferred, discharge to care n=4,988	
	%	Rate per 1,000 population (95% CI)	%	Rate per 1,000 population (95% CI)	%	Rate per 1,000 population (95% CI)
Age (years)						
18-44	20.5	8.7 (8.5-8.9)	22.1	8.3 (8.1-8.4)	8.8	0.4 (0.4-0.5)
45-64	37.0	18.1 (17.9-18.4)	38.5	16.7 (16.4-16.9)	25.6	1.5 (1.4-1.6)
≥65	42.5	39.5 (39.0-40.1)	39.4	32.4 (31.9-32.9)	65.6	7.2 (6.9-7.4)
Sex						
Male	47.0	17.2 (17.0-17.5)	46.4	15.0 (14.8-15.2)	51.1	2.2 (2.1-2.3)
Female	53.0	19.3 (19.1-19.6)	53.6	17.3 (17.0-17.5)	48.9	2.1 (2.0-2.2)
Residence						
Urban	18.2	22.5 (22.0-23.0)	20.2	22.0 (21.5-22.5)	3.3	0.5 (0.4-0.6)
Rural	51.3	16.5 (16.3-16.7)	52.6	14.9 (14.7-15.1)	41.2	1.6 (1.5-1.6)
Frontier	30.5	19.7 (19.4-20.0)	27.1	15.5 (15.2-15.8)	55.5	4.2 (4.0-4.4)

Note: The denominator for rates on this table is the number of persons in each population category. The numerator is the number of ED visits. The data source of ED visits did not identify individual patients so it was not possible to determine the number of persons who had more than one ED visit.

Complications of Diabetes

The majority of Montana diabetes-related ED visits (88.9%) have no mention of complications (Table 2), which is similar to national results.[2]

- The majority of patients who were treated and released or admitted, transferred, or discharged to additional care had diabetes with no complications.

Diabetes increases the risk for many serious health complications.

- The most frequently listed known complications were other or unspecified complications followed by neurologic complications.
- Patients who were admitted, transferred, or discharged to additional care more frequently had other or unspecified complications followed by acute complications.

Diabetes increases the risk of heart disease, stroke, kidney failure, influenza, and pneumonia. It also can lead to blindness, amputations, and pregnancy complications.[6]

Table 2. Types of all diabetes-related diagnosis during emergency department visits by diabetes complications, Montana residents aged 18 years and over, 2010-2012

Listed conditions	All diabetes-related ED visits		Treated and released		Admitted, transferred, discharge to care	
	Number of visits	%	Number of visits	%	Number of visits	%
All diabetes	42,521	100	37,533	100	4,988	100
Diabetes with no mention of complications (uncontrolled)	37,783	88.9	33,549	89.4	4,234	84.9
Diabetes with complications[a]	4,738	11.1	3,984	10.6	754	15.1
Other or unspecified complications	2,478	5.8	2,187	5.8	291	5.8
Neurologic complications	1,191	2.8	1,031	2.7	160	3.2
Renal complications	460	1.1	365	1.0	95	1.9
Acute complications	409	1.0	240	0.6	169	3.4
Eye complications	118	0.3	94	0.3	24	0.5
Peripheral circulatory complications	82	0.2	67	0.2	15	0.3

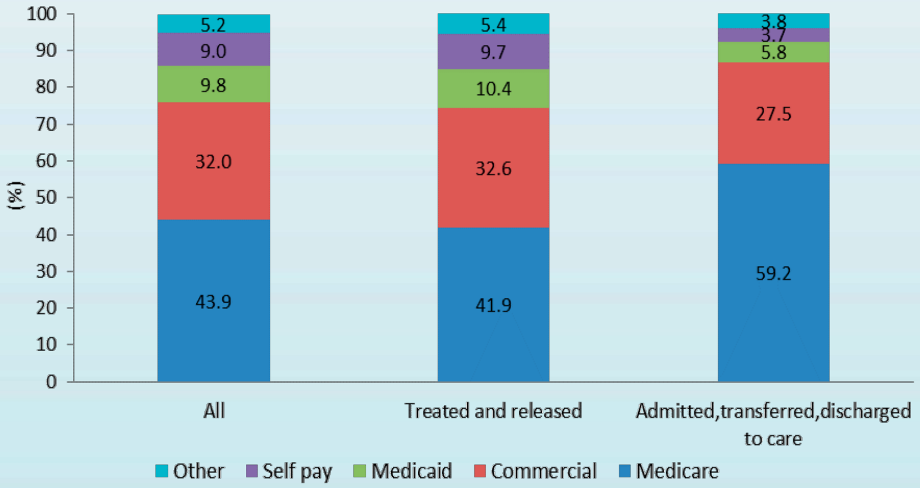
[a] Complications are based on the first listed diabetes diagnosis. In this analysis, an individual may only have one complication.

Estimated Diabetes Cost

Costs associated with ED visits for Montana patients with diabetes from 2010 through 2012 were estimated to be $95.2 million, of which 6.4% listed diabetes as the primary diagnosis. The average charge for an ED visit for an adult with uncontrolled diabetes was $2,895. Much of these costs are shared by federal, state, local governments, and other health care systems.

Medicare was the most common payer for all diabetes-related ED visits, and accounted for an even larger proportion of all ED visits that resulted in admissions, transfers, or discharges to additional care (Figure 2). Medicaid had an opposite distribution accounting for a larger proportion of all diabetes-related visits but a smaller proportion for admissions, transfers, and discharges to additional care.

Figure 2. Percentage of diabetes-related emergency department visits, Montana residents aged 18 years and over, by payer 2010-2012



A person with diabetes has about **2.3 times** the average annual health care cost of a person without diabetes.[7]

Conclusion

Diabetes continues to be a leading cause of preventable health complications that affect many parts of the body including blindness, microvascular complications and lower-limb amputations. Comprehensive diabetes care, medical and self-management have a significant impact on preventing acute diabetes complications.[8]

ED visits due to diabetes are more likely to results in admissions or transfers from ED for further care compared to ED visits due to other causes for persons without diabetes. Individuals with diabetes and diabetes-related conditions may be effectively treated in outpatient or office based settings that may be less costly to the patient and healthcare system overall.[9]

Methods

Definitions and Selection

ICD-9-CM: *International Classification of Diseases, Ninth Revision, Clinical Modification* which assigns numeric codes to diagnoses.[10] The following ICD-9-CM codes were used to identify patients with diabetes. Diabetes-related ED visit was defined as diabetes reported as a primary or secondary diagnosis.

"Primary or Secondary Diagnosis" refers to the occurrence of a diabetes-related code in the primary diagnosis field or any of the seven secondary diagnosis fields. "Primary Diagnosis" refers to diabetes code listed as the primary reason for the ED visit.

Table 3. Diabetes Diagnosis Description	**ICD-9-CM Code**
Uncontrolled diabetes without mention of complications	250.0x
Diabetes with renal complications	250.4x
Diabetes with eye complications	250.5x
Diabetes with neurological complications	250.6x
Diabetes with peripheral circulatory complications	250.7x
Diabetes with other or unspecified complications	250.8x-250.9x
Diabetes with acute complications	250.1x-250.3x
Diabetes with complications	250.1x-250.9x

The unit of analysis is the ED visit, not the patient. A person who visits ED multiple times during the year will be counted each time as a separate ED visit. As result, the actual number of patients visiting ED cannot be estimated accurately as individuals can visit ED more than once during a time interval of interest.

Data were limited to Montana residence. The three classifications for county of residence living areas are urban, rural, and frontier. Living areas were collapsed to three categories (urban, rural and frontier) and are based on the US Census Bureau.[11]

Data Sources

The findings are based on the data from the Emergency Department Discharge data from 2010 through 2012. Age-adjusted rates are based on the data from the National Center for Health Statistics.[12]

The Montana Hospital Discharge Data System (MHDDS) receives annual de-identified data sets through Memoranda of Agreement with the Montana Hospital Association and the Montana State Hospital. Most hospitals in Montana participate in voluntary reporting of discharge data from Uniform Billing Forms, version 2004. The MHDDS receives information on more than 90% of the inpatient admissions from non-psychiatric facilities and all admissions from the only public adult psychiatric facility in the state.

Clinical Recommendations

1. Implement a coordinated care team, such as a patient- centered medical home model, to provide multidisciplinary support for patients with diabetes.

2. For patients with diabetes who have been hospitalized, ensure that the care transition includes a referral to Diabetes Self-Management Education and Support (DSME/S) to help avoid a preventable readmission or another emergency event.

3. Make a routine referral for DSME/S, especially for Medicare beneficiaries to promote the utilization of DSME/S benefit.

4. During patient follow-up appointments and with the support of pharmacists, answer questions about properly taking prescribed medications and address barriers to medication adherence.

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