

# Nevada Compare Care



## Ischemic & Hemorrhagic Stroke Report

Center for Health Information Analysis

Norah Langendorf, M.Ed

2009

---

*NevadaCompareCare.Net is one piece of the health information transparency effort in Nevada.*

*The website is produced by UNLV's Center for Health Information Analysis, under contract with the Division of Health Care Financing and Policy, of the Department of Health and Human Services.*

*This report is made available for general information purposes only. It in no way implies medical advice and should not be taken as such. It is important to consult with your private physician for answers to any health questions.*

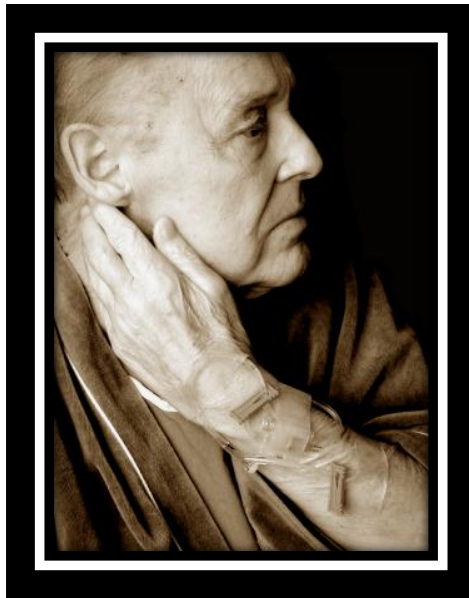
*All data, for the State of Nevada, listed in this report was graciously supplied by Intellimed Services.*

## **At a Glance**

In 2009, there were 5,143 reported stroke cases. This number includes: 181 acute ischemic stroke, 3,411 hemorrhagic or cerebral infarction, and 1,551 trans ischemic strokes – TIA's, or mini-strokes.

A majority (61%) of the cases comprised male and female patients 65-years of age or older. This percentage is made up of 853 mini-strokes and 2,266 non-TIA strokes.

The total charges for hospitalization of regular strokes in 2009 were \$538,321.40. The average length of stay for all age groups was 6.12 days. The age group with the highest average length of stay can be found in the 50-64-year old range (7.6 days). The age group with the highest average charges is the 39-49 year old range, (\$61,233).



## Stroke

Our brains are made up of billions of neurons that can be found in different locations, or lobes, which help control every aspect of our bodies – from involuntary movements such as breathing to voluntary movements such as walking, sitting, and using our hands (NIH, 2007). When blood flow to the brain is interrupted, an acute ischemic stroke (AIS) can occur. Interruptions can be caused by large vessel [atherosclerosis](#), small vessel disease, or in rare cases, from [arterial dissection](#) which can cause ischemic strokes in children. Because blood carries vital components such as glucose and oxygen to the brain, when blood flow is decreased, the result

is neurons begin to die (Aldeen & Piroette, 2009). Ischemic strokes account for approximately 80% of all strokes. Hemorrhagic strokes, caused by bleeding into the brain, account for 20% of identified stroke victims. This type of stroke causes brain tissue damage due to pressure created by blood hemorrhaging (NINDS, 2009). According to the Agency for Healthcare Research and Quality (AHRQ), stroke is the 3<sup>rd</sup> leading cause of death in the United States. Strokes can have a debilitating effect on our ability to think and function normally which can result in permanent mental and physical disability (Alattar, 2010).



## **Transient Ischemic Attack (mini-stroke)**

A transient ischemic attack (TIA) has many of the same symptoms as a regular stroke. These include: possible weakness, or numbness on one side of the body, difficulty speaking and understanding others, blurred vision, loss of coordination, and severe headaches with no known cause. The main difference between a TIA and a regular stroke is measured in the length of time these symptoms last. On average, the symptoms of a TIA last about a minute. It is extremely important that these mini-strokes be taken seriously. Although some stroke victims have never experienced a TIA, according to the Mayo Clinic, “about one in three people who have a transient ischemic attack eventually

### **Risk Factors**

Gender, age, and heredity, can increase a person’s chance of being a stroke victim. Men are more likely than women to have a stroke, but women die from strokes more often than men. As we get older, our risk of having a stroke increases significantly. According to the American Heart Association, our risk doubles for each decade of life after we reach the age of 55 (AmericanHeartAssociation, 2010b).

Diabetes and high blood pressure (hypertension) are risk factors that increase our chance of having a stroke. Hypertension forces the heart to work harder to pump blood

### **Prevention**

The National Institutes of Health reports that there are more than 700,000 people, each year, who suffer a stroke (NINDS, 2007). It is the third leading cause of death in the United States. Strokes can cause brain damage, paralysis, communication problems, and emotional problems. Eating healthy foods in moderation, as well as exercising, can help us

has a stroke”(MayoClinicStaff, 2009).

Almost half of those who suffer a TIA will go on to have a stroke within a year. The causes for a mini-stroke are much the same as those for regular strokes. The only difference being that the blood clot in a TIA is much smaller than that of a regular stroke, and it usually resolves on its own. While this may be the case, if you believe you are experiencing a transient ischemic attack, seek immediate medical attention (MayoClinicStaff, 2009). This will alert your doctor that long-term medication to help your blood clot should be prescribed (WebbMD, 2009). By paying attention to the warning signs, you may prevent a stroke.

throughout the body. Diabetes increases the elevation of LDL cholesterol which has the potential to clog arteries due to fatty deposits (NIDDK, 2005). Smoking also increases our risk of being a stroke victim. According to the National Institute of Neurological Disorders and Stroke, there is a link between cigarette smoking and the buildup of “fatty substances in the carotid artery” (NINDS, 2009), Strokes affect people of all ages (even *in utero*) and ethnic groups. African-Americans are more commonly affected than any other race (NINDS, 2009).

prevent a stroke. Managing high blood pressure, diabetes, and quitting smoking, is another way to increase our chances of avoiding this condition. Even if you have suffered a previous stroke, by following the advice listed above, you can lower your risk of having another stroke (NINDS, 2007).

## Signs to Look For

Getting immediate medical attention for a person who is suffering from a stroke can save a life. There are signs you can look for to assess whether or not you think someone is having a stroke:

- Sudden numbness or weakness of the face, arm, or leg, especially if the person complains that it is affecting only one side of the body.
- You notice that a person has suddenly become confused or disoriented.
- The person suddenly has trouble with their balance or complains of dizziness.
- The person complains of a severe headache with no apparent cause.

The key word for most of these symptoms is that they manifest themselves suddenly as opposed to a person's normal behavior. Because the person who has these symptoms may not realize that they are having a stroke, it is vitally important that once you observe the above symptoms, call 9-1-1 immediately. There are treatment options available, such as [Thrombolytic Therapy](#), for stroke victims that can dramatically reduce the debilitating effects of stroke. As always, [risk factors](#) are involved with any treatment option, and it is important to know what they are. [Click here](#) to learn more about what you can do to possibly save a life of someone you know.

## 2009 Nevada Inpatient Data

In 2009, there were 3,591 cases of ischemic and hemorrhagic stroke that required hospitalization in Nevada. This number only includes cases coded by MS-DRG, as opposed to individual diagnosis codes. Transient Ischemic Attack (TIA) data will be covered further down in this report. Table 1 separates the number of cases by MS-DRG. The totals for acute ischemic stroke with and without complications can be seen in MS-DRG's 061-063. We only have data for acute ischemic strokes where a thrombolytic agent (clot buster) was used. It is important to use caution, when viewing data, because many factors such as prior health problems, or age, may skew the totals where complications in

using thrombolytic agents are documented. According to a 1997 New England Journal of Medicine publication, caution should be used in utilizing tissue plasminogen activator (t-PA) until a specific diagnosis as to the cause and location of the occlusion (blockage) can be determined. This recommendation was challenged by medical researchers who hold to the belief that t-PA should be the first line of defense against ischemic strokes (Debate, 1997). While this report attempts to include both the benefits and the risks of thrombolytic therapy, it is essential to recognize the importance of discussing treatment options with your physician.

**Table 1. Total cases of strokes for 2009 by MS-DRG.**

MS-DRG/Description	Total
061 - ACUTE ISCHEMIC STROKE W USE OF THROMBOLYTIC AGENT W MCC	52
062 - ACUTE ISCHEMIC STROKE W USE OF THROMBOLYTIC AGENT W CC	95
063 - ACUTE ISCHEMIC STROKE W USE OF THROMBOLYTIC AGENT W/O CC/MCC	34
064 - INTRACRANIAL HEMORRHAGE OR CEREBRAL INFARCTION W MCC	919
065 - INTRACRANIAL HEMORRHAGE OR CEREBRAL INFARCTION W CC	1357
066 - INTRACRANIAL HEMORRHAGE OR CEREBRAL INFARCTION W/O CC/MCC	1134
<b>Grand Total</b>	<b>3591</b>

As mentioned earlier, hemorrhagic stroke (DRG's 064 – 066) is caused when a blood vessel in the brain bursts. High blood pressure

is a common factor in hemorrhagic strokes. Another type of hemorrhagic stroke is called Subarachnoid hemorrhage. This type of stroke

is mainly caused by a ruptured aneurysm (Aneurism). A severe headache is usually a warning signal that this type of stroke has occurred. This particular type of headache is called a ‘Thunderclap’ headache (MayoClinicStaff, 2010). It is impossible to deduce from the above MS-DRG descriptions the exact origin of the hemorrhaging or whether or not it started as an occlusion. MS-DRG codes are used mainly for reimbursement

purposes and do not include detailed information such as primary or secondary diagnosis. The American Heart Association bases their ischemic/hemorrhagic stroke statistics on individual diagnosis codes. This may account for the seeming discrepancy between what the national publications state as the primary type of stroke (ischemic) and what the above data show (AmericanHeartAssociation, 2010a)

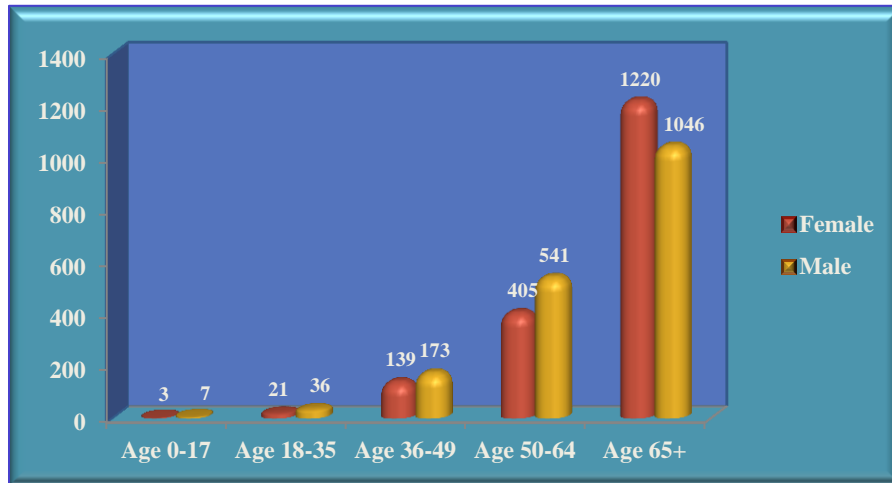


Figure 1.1 Number of hospitalizations for stroke, by age group and gender, in 2009

### 2009 Hospitalization Data

Figure 1.1 shows the number of hospitalizations by age group and gender for 2009. The trend for this category, with the exception of the 65+ age group, points to a higher number of male cases than female cases. This trend corresponds to the statistics gathered by the American Heart Association which states, “Men’s stroke incidence rates are greater than women’s at younger ages but not at older ages. The male/female incidence ratio is 1.25 at ages 55 – 64; 1.5 for ages 65 – 74; 1.07 at 75 – 84 and 0.76 at age 85 and older. (ARIC and CHS studies)” (AmericanHeartAssociation, 2010a). Keep in mind that number of cases in Nevada does not equal number of patients as a person can be hospitalized multiple times for illnesses such as stroke. As we get older, our risk of getting a stroke does go up (TexasStrokeInstitute, 2010).

Table 2 (below) differentiates the number of hospitalizations by gender and age group. It also includes average length of stay and total charges for these demographics. The 50 – 64 age range for both genders shows the highest average length of stay and total charges. It is interesting to note that the average for length of stay and total charges goes down in the 65+ age group. The average length of stay for this group is 2.7 days and \$14,358.66 less than the 50 – 64 age groups. In every age group category, the male cases have a longer average length of stay than the female cases. However, this is not the case for total charges. In the 0-17 age group, the average total charges for female cases exceed that of male cases by a difference of \$4,980.24.

**Table 2. Total cases of Stroke, by gender and age group, with average length of stay and charges for 2009.**

Age Group	Gender	Average Length of Stay	Average of Total Charges	Average total of Length of Stay/ Total Charges for both genders by age group.
0 - 17	Female = 3	4 days	\$49,277.67	4.7 days/\$45,791.5
	Male = 7	5 days	\$44,297.43	
18 - 35	Female = 21	5.4 days	\$46,631.33	6.6 days/\$57,389.56
	Male = 36	7.4 days	\$63,081.86	
36 - 49	Female = 139	6.8 days	\$58,009.79	6.8 days/\$61,233.64
	Male = 173	7 days	\$64,024.08	
50 - 64	Female = 405	6.8 days	\$57,169.97	7.6 days/\$60,605.01
	Male = 541	8.3 days	\$63,176.51	
65+	Female = 1220	4.8 days	\$45,284.20	4.9 days/\$46,246.35
	Male = 1046	4.9 days	\$47,368.56	

### Race

According to the U.S. Dept. of Health and Human Services, “blacks are more likely than whites to die of a stroke” (Dreyfuss, 2010). Researchers cannot pinpoint the exact reasons for why African-Americans are more likely to have a stroke, but they caution that people who are at a higher risk of getting a stroke should pay attention to illnesses, such as high blood pressure, diabetes, and if you smoke, quit!

Table 3 (below) displays three out of the 19 total discharge status categories: Home or Self Care, Expired (deceased), and those patients discharged to Hospice care. The table also separates discharge status by race. In 2009, only four cases of stroke were identified as Native American/Alaskan. Of that total, 75% were released to Home or Self Care with 25% having expired. While this total seems high, keep in mind that the total number is very low,

so this category can be considered an outlier. Asian/Pacific Islander comprised 88 total cases of stroke with 88% (77/88) discharged to Home or Self Care while 13% expired (11/88). The percentage of Blacks released to Home or Self Care, in 2009, was 83% (125/150) while 17% of the cases died of stroke. The race category with the second highest percentage of deaths due to stroke is Whites with 20% (219/1104). While this may seem to contradict what the experts are saying about Blacks dying more often from stroke, according to the U.S. Census Bureau, African-Americans make up only 12% of the population (U.S.CensusBureau, 2010). Cases identified as Hispanic had an 88% discharge rate for Home or Self Care, while 13% of the cases died from stroke. These totals are similar to that of Asian/Pacific Islanders.

**Table 3. Total number of stroke cases\*, in 2009, by Race and Discharge Status.**

Race	Total # of Strokes	Home or Self Care	Expired	Hospice
Native American/Alaskan	4	3	1	
Asian. Pacific Islander	88	77	11	
Black	150	125	25	
White	1104	854	219	31
Hispanic	203	172	27	4

\*These totals do not include races coded unknown or other. Not all discharge Status types/numbers are included.

### Transient Ischemic Strokes, 2009

As mentioned earlier in this report, transient ischemic strokes, TIA's or mini-strokes, are often warning signals that a regular stroke will occur and need to be taken seriously. Figure 1.2 shows the total number of cases for TIA's in 2009 by gender and age group. Unlike figure 1.1, the chart below reflects a trend

where in every age group (except 0 – 17), the number of female cases are higher than their male counterparts. The age group with the greatest range between male and female cases is the 65+ age group (475-378 = 97). The age group with the least number of cases between genders is 18 – 35 age groups (35-18 = 16).

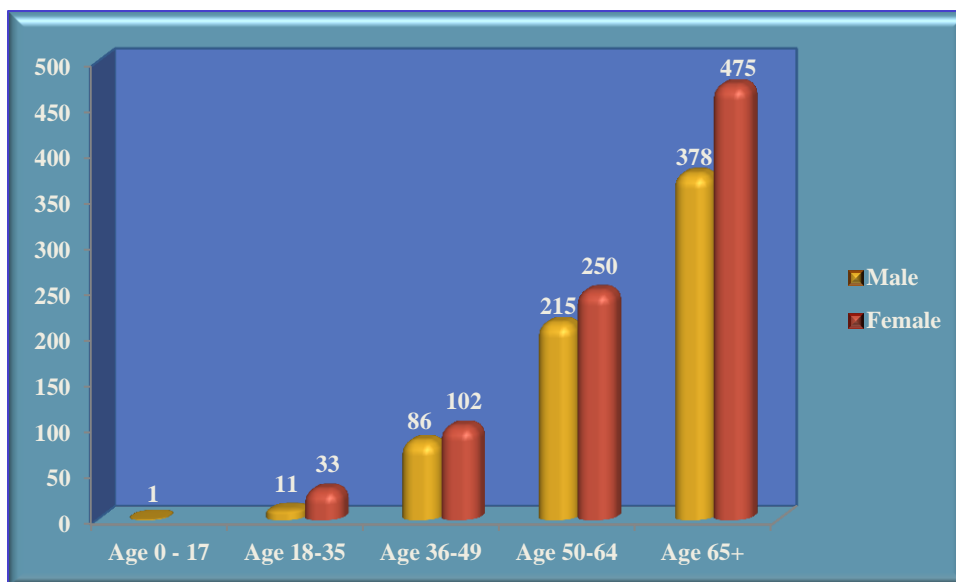


Figure 1.2 Total Transient Ischemic Strokes, by gender and age groups, for 2009.

### Hospital Data

In 2009, 28 hospitals treated mini-stroke cases. Valley Hospital Medical Center saw the most cases (N=270) while three hospitals (Battle Mountain, Boulder City, and Mount Grant) saw the fewest cases (N=1). Categorically, Clark County has 15 of the 28 hospitals that treated a total of 1,118 cases of

mini-stroke, which comes out to 72.1% of the total cases treated in 2009. The total number of cases in Clark County is almost three times the number of all other counties in Nevada combined (N=433). Esmeralda, Eureka, and Lander County each saw one mini-stroke case in 2009.

Table 4. Total number of mini-stroke cases, in 2009, by hospital

Hospital Name	Number of cases
Battle Mountain General Hospital	1
Boulder City Hospital	1
Carson Tahoe Regional Medical Center	44
Carson Valley Medical Center	6
Centennial Hills Hospital Medical Center	106
Churchill Community Hospital	14
Desert Springs Hospital	96
Desert View Regional Medical Center	19
Mesa View Regional Hospital	5
Mount Grant General Hospital	1

Mountain View Hospital	60
North Vista Hospital	26
Northeastern Nevada Regional Hospital	6
Northern Nevada Medical Center	5
Nye Regional Medical Center	3
Renown Regional Medical Center	140
Renown South Meadows Medical Center	18
Saint Mary's Regional Medical Center	40
Saint Rose Dominican Hospitals Rose de Lima Campus	47
Saint Rose Dominican Hospitals San Martin Campus	51
Saint Rose Dominican Hospitals Siena Campus	78
Southern Hills Hospital & Medical Center	15
Spring Valley Hospital Medical Center	218
Summerlin Hospital Medical Center	76
Sunrise Hospital & Medical Center	136
University Medical Center of Southern Nevada	67
Valley Hospital Medical Center	270
William Bee Ririe Hospital	2

## Conclusion

Strokes can have a debilitating effect on our physical, emotional, and psychological well being. Paralysis, cognitive reasoning skills, and depression are just a few of the ways that strokes can negatively impact our lives. Knowing the signs of a stroke such as sudden numbness – especially focused on one side of the body, confusion, or complaint of acute pain with no known cause, may alert us that the fact that someone is suffering a stroke. It is important to remember that the quicker someone who is suffering a stroke receives

medical attention, the better the prognosis for a positive outcome. While there is no guarantee that we can totally avoid a stroke, there are healthy life-style changes we can all make that will lower our chances of having one. Since diabetes and hypertension are factors that put us at risk, it is important to watch what we eat, exercise, and follow our doctor's advice by taking prescribed medication. Lowering our cholesterol to help avoid blockages in our arteries is also good advice in maintaining a healthy lifestyle.

## References

- Alattar, M., M.D. (2010, July 21, 2010). Comprehensive Stroke Program Featuring Protocols, 24-Hour Neurologist Access, Ongoing Training, and Other Support Leads to Significantly More Patients Receiving Appropriate, Timely Diagnosis and Treatment Retrieved December 3, 2010, 2010, from <http://www.innovations.ahrq.gov/content.aspx?id=2782>
- Aldeen, A. M. D., & Pirotte, M. M. D. (2009). Focus On: Acute Ischemic Stroke. *Focus On*: Retrieved September 10, 2010, 2010, from <http://www.acep.org/acepnews.aspx?LinkIdentifier=id&id=46268&fid=92229&Mo=No&taxid=112591>
- AmericanHeartAssociation. (2010a). Heart Disease & Stroke Statistics. *2010 Update At-A-Glance* Retrieved December 7, 2010, 2010, from [http://www.americanheart.org/downloadable/heart/1265665152970DS-3241%20HeartStrokeUpdate\\_2010.pdf](http://www.americanheart.org/downloadable/heart/1265665152970DS-3241%20HeartStrokeUpdate_2010.pdf)
- AmericanHeartAssociation. (2010b). Stroke Risk Factors. Retrieved September 13, 2010, 2010, from <http://www.americanheart.org/presenter.jhtml?identifier=4716>
- Debate, C. (1997, October 30, 1997). Should Thrombolytic Therapy Be the First-Line Treatment for Acute Ischemic Stroke? 337. Retrieved December 2, 2010, 2010, from <http://www.nejm.org/doi/full/10.1056/NEJM199710303371812#t=article>
- Dreyfuss, I. (2010, February 28, 2010). HHS HealthBeat. *Race and Stroke* Retrieved December 14, 2010, 2010, from <http://www.hhs.gov/news/healthbeat/2010/03/20100301a.html>
- MayoClinicStaff. (2009). Transient Ischemic Attack (TIA). Retrieved November 30, 2010, 2010, from <http://www.mayoclinic.com/health/transient-ischemic-attack/DS00220/DSECTION=symptoms>
- MayoClinicStaff. (2010). Stroke. Retrieved December 3, 2010, 2010, from <http://www.mayoclinic.com/health/stroke/DS00150/DSECTION=causes>
- NIDDK. (2005). Diabetes, Heart Disease, and Stroke. Retrieved October 6, 2010, 2010, from <http://diabetes.niddk.nih.gov/dm/pubs/stroke/>
- NIH. (2007). Information About The Brain. *NIH Curriculum Supplement Series* Retrieved September 10, 2010, 2010, from <http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=curriculum&part=A239>
- NINDS. (2007, September 11, 2007). What You Need to Know About Stroke. Retrieved October 15, 2010, 2010, from [http://www.ninds.nih.gov/disorders/stroke/stroke\\_needtoknow.htm#prevent](http://www.ninds.nih.gov/disorders/stroke/stroke_needtoknow.htm#prevent)
- NINDS. (2009, June 29, 2009). Brain Basics: Preventing Stroke. Retrieved October 8, 2010, 2010, from [http://www.ninds.nih.gov/disorders/stroke/preventing\\_stroke.htm](http://www.ninds.nih.gov/disorders/stroke/preventing_stroke.htm)
- TexasStrokeInstitute. (2010). Stroke Types. Retrieved December 10, 2010, 2010, from <http://texasstrokeinstitute.com/patients-and-families/stroke-types.dot>
- U.S.CensusBureau. (2010, August 16, 2010). State & County QuickFacts. Retrieved December 14, 2010, 2010, from <http://quickfacts.census.gov/qfd/states/00000.html>
- WebbMD. (2009, November 11, 2009). Transient Ischemic Attack (TIA) - Treatment Overview. Retrieved November 30, 2010, 2010, from <http://www.webmd.com/stroke/tc/transient-ischemic-attack-tia-treatment-overview?page=2>