The State of Stroke and Stroke Systems of Care in Washington
September 14, 2017
Learning Objectives

• Understand the burden of stroke and the role of public health, healthcare, EMS, and community services in preventing it and improving outcomes
• Review the Coverdell Stroke Program
• Identify tools and strategies to prevent and improve stroke in your communities
# Heart Disease and Stroke Are the Leading Cause of Death Among Washington Residents, 2013-2015

<table>
<thead>
<tr>
<th>Rank</th>
<th>Underlying Cause</th>
<th>Number Deaths</th>
<th>Percent of Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cancer</td>
<td>36660</td>
<td>23%</td>
</tr>
<tr>
<td>2</td>
<td>Heart Disease</td>
<td>32006</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Coronary Heart Disease</td>
<td>19309</td>
<td>12%</td>
</tr>
<tr>
<td></td>
<td>Heart Attack</td>
<td>6039</td>
<td>4%</td>
</tr>
<tr>
<td>3</td>
<td>Alzheimer's</td>
<td>10097</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td>Chronic lower respiratory diseases</td>
<td>8966</td>
<td>6%</td>
</tr>
<tr>
<td>4</td>
<td>Accidents</td>
<td>8900</td>
<td>6%</td>
</tr>
<tr>
<td>5</td>
<td>Stroke</td>
<td>7947</td>
<td>5%</td>
</tr>
<tr>
<td>6</td>
<td>All Other Causes</td>
<td>14121</td>
<td>9%</td>
</tr>
</tbody>
</table>

**Washington Death Certificates 2013-2015**
Stroke Deaths Decreasing


Age-Adjusted Rate per 100,000

- 2006: 43.34
- 2015: 34.4

Washington State Department of Health

Washington Death Certificates 2006-2015
Higher Rates of Death For Different Regions

Age-adjusted death rates per 100,000 persons, 2013-2015 combined

Stroke

- Adams
- Pacific
- Stevens
- Whitman
- Spokane
- Okanogan
- Clallam
- Grant
- Lewis
- Yakima
- Grays Harbor
- Asotin
- Franklin
- Pierce
- Whatcom
- Cowlitz
- Snohomish
- Pend Oreille
- State Total
- Skagit
- Island
- Walla Walla
- Clark
- Thurston
- Kitsap
- Mason
- Chelan
- King
- Klickitat
- Jefferson
- Benton
- Douglas
- Kittitas
- San Juan
- Garfield
- Ferry
- Skamania
- Columbia
- Wahkiakum
- Skamania
- Lincoln

High Rate
- Adams
- Pacific
- Pierce
- Spokane
- Stevens

*Unstable rates not shown due to small numbers.
Stroke Hospitalizations Decreasing

Washington State Hospitalization from Stroke, 1990-2014

Data Source: Washington State Comprehensive Hospital Abstract Reporting System (CHARS) 1990-2014
Higher Rates of Hospitalizations For Different Regions

Age-adjusted hospitalization rates per 100,000 persons, 2012-2014 combined

Stroke

<table>
<thead>
<tr>
<th>Region</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Franklin</td>
<td>218</td>
</tr>
<tr>
<td>Grays Harbor</td>
<td>209</td>
</tr>
<tr>
<td>Snohomish</td>
<td>205</td>
</tr>
<tr>
<td>Lewis</td>
<td>205</td>
</tr>
<tr>
<td>Yakima</td>
<td>204</td>
</tr>
<tr>
<td>Pierce</td>
<td>202</td>
</tr>
<tr>
<td>Chelan</td>
<td>198</td>
</tr>
<tr>
<td>Lincoln</td>
<td>196</td>
</tr>
<tr>
<td>Benton</td>
<td>196</td>
</tr>
<tr>
<td>Walla Walla</td>
<td>195</td>
</tr>
<tr>
<td>Skagit</td>
<td>193</td>
</tr>
<tr>
<td>Spokane</td>
<td>191</td>
</tr>
<tr>
<td>Pend Oreille</td>
<td>190</td>
</tr>
<tr>
<td>Mason</td>
<td>186</td>
</tr>
<tr>
<td>State Total</td>
<td>181</td>
</tr>
<tr>
<td>Grant</td>
<td>181</td>
</tr>
<tr>
<td>Clark</td>
<td>180</td>
</tr>
<tr>
<td>Clallam</td>
<td>178</td>
</tr>
<tr>
<td>Cowlitz</td>
<td>173</td>
</tr>
<tr>
<td>King</td>
<td>173</td>
</tr>
<tr>
<td>Okanogan</td>
<td>169</td>
</tr>
<tr>
<td>Stevens</td>
<td>166</td>
</tr>
<tr>
<td>Pacific</td>
<td>165</td>
</tr>
<tr>
<td>Columbia</td>
<td>164</td>
</tr>
<tr>
<td>Thurston</td>
<td>162</td>
</tr>
<tr>
<td>Kittitas</td>
<td>159</td>
</tr>
<tr>
<td>Kitsap</td>
<td>158</td>
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<tr>
<td>Skamania</td>
<td>158</td>
</tr>
<tr>
<td>Whatcom</td>
<td>158</td>
</tr>
<tr>
<td>Jefferson</td>
<td>146</td>
</tr>
<tr>
<td>Island</td>
<td>142</td>
</tr>
<tr>
<td>Klickitat</td>
<td>127</td>
</tr>
<tr>
<td>Adams</td>
<td>122</td>
</tr>
<tr>
<td>San Juan</td>
<td>120</td>
</tr>
<tr>
<td>Whitman</td>
<td>116</td>
</tr>
<tr>
<td>Asotin</td>
<td>89</td>
</tr>
<tr>
<td>Garfield*</td>
<td></td>
</tr>
<tr>
<td>Wahkiakum*</td>
<td></td>
</tr>
<tr>
<td>Ferry*</td>
<td></td>
</tr>
</tbody>
</table>

High Rates
- Benton
- Franklin
- Grays Harbor
- Lewis
- Pierce
- Snohomish
- Spokane
- Yakima

*Unstable rates not shown due to small numbers.
Higher Rate of Hospitalizations Among Older Adults

Sex-and age-specific hospitalization rates per 100,000 persons, 2012-2014 combined

**Heart Attack**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-24</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>25-34</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>35-44</td>
<td>42</td>
<td>114</td>
</tr>
<tr>
<td>45-54</td>
<td>1,505</td>
<td>1,382</td>
</tr>
<tr>
<td>55-64</td>
<td>520</td>
<td>696</td>
</tr>
<tr>
<td>65-74</td>
<td>324</td>
<td>640</td>
</tr>
<tr>
<td>75-84</td>
<td>969</td>
<td>581</td>
</tr>
<tr>
<td>85+</td>
<td>1,024</td>
<td>74</td>
</tr>
</tbody>
</table>

**Stroke**

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<td>13</td>
<td>17</td>
</tr>
<tr>
<td>35-44</td>
<td>44</td>
<td>42</td>
</tr>
<tr>
<td>45-54</td>
<td>429</td>
<td>416</td>
</tr>
<tr>
<td>55-64</td>
<td>322</td>
<td>229</td>
</tr>
<tr>
<td>65-74</td>
<td>520</td>
<td>696</td>
</tr>
<tr>
<td>75-84</td>
<td>1,185</td>
<td>1,382</td>
</tr>
<tr>
<td>85+</td>
<td>2,113</td>
<td>2,113</td>
</tr>
</tbody>
</table>

Data Source: Washington State Comprehensive Hospital Abstract Reporting System (CHARS) 2012-2014
Washington’s Population is Aging

Population Size and Annual Change for ages 65+, 1980-2040 (Real and Forecasted)

Annual Change (left) Population (right)

Forecast

Risk Factors for Stroke in Washington


Methodology changes after 2010 prevent comparison between 2011 and later to 2010 and earlier.
High Cholesterol and Hypertension asked on odd years, even years are imputed from surrounding odd years.
Stroke Costs

Stroke Costs Reaching Trillions - Without Action, Financial Cost of Strokes to Reach $2.2 Trillion by 2050

“Strokes will absolutely strain the healthcare system,” said Bruce Ovbiagele, M.D. Caring for survivors is expensive because stroke can cause long-term disability, he said.

Hospitalizations and nursing home care in WA in 2014 est. $978.5 million

Average cost of stroke hospitalization $20,000 + $17,000 for rehab + $5000 for medications = $42,000
But if We Take Action Now...

“Doing the right thing now ultimately could be cost-saving in the future, but we have a long way to go before all Americans receive adequate stroke prevention and emergency stroke care...If our society is not going to do it for the right reasons, perhaps we can do it because it's going to be obscenely expensive.”

Devin Brown, MD, MS, assistant professor of neurology at the University of Michigan Medical School, 2006 (WebMD)
Cost Avoidance

Heart Disease

- Costs avoided if alternative path is taken
- 2011: $4.6 Billion
- 2017: $4.7 Billion
- 2023: $5.5 Billion

Stroke

- Costs avoided if alternative path is taken
- 2011: $1.2 Billion
- 2017: $1.4 Billion
- 2023: $1.8 Billion

Washington State Department of Health
Cost Avoidance

Canada study shows cost of stroke care could be reduced by $682 million with optimal stroke care:

- Rapid assessment and treatment of TIA and stroke
- Thrombolytic therapies
- Stroke units
- Early home-supported discharge
State of Stroke Systems of Care in WA

Emergency Cardiac and Stroke Care in Washington

September 2008

Emergency Cardiac and Stroke Work Group
WA Emergency Cardiac and Stroke System

Stroke
Heart attack
Cardiac arrest

→ Call 9-1-1/CPR
   Right away!

→ Dispatch EMS
   1 minute

→ EMS on-scene
   15 minutes*

→ Notify hospital

→ Door to treatment
   60–90 minutes

Interhospital transfer

→ Notify hospital

→ Transfer Hospital

* 15 minute on-scene goal for heart attack and stroke (does not apply to cardiac arrest)
Saving Time Saves Lives

- Public education
- Rapid assessment and system activation
- Standard triage and transport
- Stroke centers
- Thrombolytic therapies
- Data collection and QI

STROKE IS an EMERGENCY!
Time is Brain
Call 911
EMS Patients Get CT Faster

Door to CT <3 (median times)

- WA
- East
- West
- Southwest
- South Central
- North Central
- Northwest
- North
- Central

EMS vs All

3/15/2016
More Patients Get CT Under 25 Minutes

% Patients Door to CT < 25

- 2011: 23%
- 2012: 23%
- 2013: 28%
- 2014: 35%
- 2015: 38%
- 2016: 38%

More Patients Get CT Under 25 Minutes.
More Patients Get tPA

Percent of Ischemic Stroke Hospitalizations *treated with Tissue Plasminogen Activator (t-PA), Washington, 1999-2014

*Hospitalizations with primary diagnosis of ischemic stroke (ICD-9 diagnosis 433 to 434). Excludes transfers to other acute care facilities based on discharge status. Source: Comprehensive Hospital Abstract Reporting System (CHARS), Washington State Department of Health, Center for Health Statistics
More Patients Get tPA within 60 Minutes

Time to Intravenous Thrombolytic Therapy - 60 min
Percent of acute ischemic stroke patients receiving intravenous tissue plasminogen activator (tPA) therapy during the hospital stay who have a time from hospital arrival to initiation of thrombolytic therapy administration (door-to-needle time) of 60 minutes or less.

Time Period: 01/2011 - 12/2016; Site: Washington DOH (87910)
Time to Complete the System

Still need:

• Public Education
• Comprehensive Data System
• Verification
• Training and Quality Improvement Support
• Pre/post prevention/cooordination

Emergency Cardiac and Stroke Care in Washington
September 2008
The Components of a Stroke System of Care

http://www.cdc.gov/dhdsp/programs/stroke_registry.htm
Paul Coverdell National Acute Stroke Program

• 2000: Senator Coverdell dies from stroke
• 2001: Congress directs CDC to implement registries to measure and track acute stroke care to improve quality.
• 2015: WA gets 5-year grant, $750k/year
Coverdell Stroke Program Goals

• Prevent strokes
• Reduce death and disability
• Reduce healthcare costs

And a 1000 others goals along the way, like reduce time to treatment, reduce readmissions, improve transitions, quit smoking, lose weight, start exercising...
Major Strategies

• Increase public awareness, use of 911
• Collect and analyze stroke data through an integrated system to evaluate and drive QI
• Support training and QI across the care continuum
• Improve post acute care
• Support systems of care
• Sustain it
Start With You and Your Family

- High blood pressure?
- High cholesterol?
- Smoking?
- No physical activity?
- Love affair with donuts?

- It’s not just stroke; heart attack, diabetes, dialysis, dementia.
What’s Your Motivation?
Fire/EMS/Hospitals

- Do blood pressure readings for your community and educate on stroke risks, signs and symptoms, FAST.
- Give bags, magnets, pens.
- Join Coverdell – collect stroke data in GWTG, use it for quality improvement. EMS, collect stroke data, update to NEMSIS v3, submit to WEMSIS/Coverdell, track and improve on stroke Key Performance Indicators.
- Improve data sharing – complete run sheets to hospital, hospitals get feedback on patient dx and outcomes to EMS.
- Participate in your regional cardiac and stroke quality improvement groups.
- Start/get involved in Community Stroke Teams or care transitions groups to address primary and secondary prevention.
In Conclusion...

• We’re aging, with lots of stroke risk factors.
• Stroke is devastating, and COSTS A LOT.
• Stroke is preventable and treatable – we have and we can MAKE A DIFFERENCE.
• We have OPPORTUNITY right now.
• It’s TIME! Let’s do this thing!
Are you in?

Kim Kelley, MSW, Coverdell Stroke Program Coordinator,  
kim.Kelley@doh.wa.gov  360-236-2807
Jim Jansen, MPH, Stroke Epidemiologist  
Jim.Jansen@doh.wa.gov  360-236-2821
Data Sources

Deaths: Death Certificate Data—Washington State Department of Health, Center for Health Statistics. Deaths are underlying cause only.


Data Sources, cont.

**Hospitalizations:** Hospitalization Discharge Data: Comprehensive Hospital Abstract Reporting System (CHARS), Washington State Department of Health, Center for Health Statistics. Hospitalizations are primary diagnosis only.

The unit of observation in this analysis is the hospitalization episode, not the individual. Thus, one person hospitalized three times in a year counts as three hospitalizations for that year. The number of hospitalizations gives us a better picture of the public health impact of a condition. Each hospitalization for an illness or injury is an adverse event for the person who experiences it. Many hospitalizations are potentially avoidable through reductions in the factors that cause diseases and injuries or through early detection and rapid treatment.

For this analysis, the data figures do not include hospitalizations for Washington residents from U.S. Department of Veterans Affair Hospitals (VA), or federal hospitals, or Idaho hospitals service Washington residents of border counties. Hospitalization data does include Oregon hospitalizations of Washington residents. From the Office for Oregon Health Policy Research for years 1990 to 1999 and from the Oregon State Inpatient Database (SID) for years 2000 to 2014 as part of the Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality.