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Use of mortality as measure of stroke care questioned

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A new study disputes the effectiveness of mortality as a measure of the quality of care provided by hospitals to stroke patients. The paper – which was simultaneously presented today at the International Stroke Conference in San Diego and published in the journal *Stroke* – found that use of do-not-resuscitate (DNR) orders differ widely between hospitals and that this variation can significantly skew a hospital's quality "ranking" based on mortality.

"With mortality increasingly being used as a marker for the quality of care provided to stroke patients, it is essential that we understand the impact of decisions made by physicians and families to limit or withhold care," said Adam G. Kelly, M.D., a neurologist with the University of Rochester School of Medicine and Dentistry and chief of Neurology at Highland Hospital. "It is clear from our research that not only is the use of DNRs all over the map, but that this variation can affect efforts to assess quality of care."

The national movement toward measuring and publically reporting quality of care data and – in the case of the federal government – linking this information to payment has spurred a discussion in the medical community over which metrics accurately reflect how well an institution is doing.

One such example in the use of 30-day risk adjusted mortality for stroke. The measure, which indicates whether a stroke victim died within a month of being admitted to a hospital, has been used by

organizations such as Healthgrades as one of the primary indicators of a hospital's quality of stroke care. Furthermore, the Centers for Medicare and Medicaid Services is in the process of developing a reporting model to measure stroke care that may also include 30-day mortality.

For some time physicians have questioned whether or not mortality is an appropriate measure of stroke care. DNRs are often put in place to limit some life-extending interventions for patients who have had a severe stroke. However, mortality statistics do not distinguish between an individual who has died because of poor or unsafe care versus someone who died because a conscious decision was made to withhold invasive or heroic measures.

"Stroke may be different from other conditions that use mortality as a metric in many important ways," said Kelly. "Because the condition can result in severe disability, many patients and their families opt against high-intensity care. This implies that early mortality after a stroke is not always the worst outcome from a patient's perspective."

Unfortunately, the circumstance in which a DNR is utilized is not always clear cut. Some DNRs are in place before the individuals suffer a stroke, however, others may reflect pessimism on the part of providers and families regarding the severity of the stroke and potential long-term outcome. In this situation, early limits on interventions could impair post-stroke recovery.

While the intention in both cases is to prevent needless suffering and severe disability, the driving force behind these decisions can vary. While data sources are not specific on this point, use of DNRs could be influenced by hospital-specific processes or cultures, the inclinations of specific providers, or local and regional variability in patient preference.

"DNRs, when properly implemented, are an important component of

providing patient-centered care," said Kelly. "However, finding the right balance that avoids arriving at the decision to limit interventions too quickly or continuing on a course of aggressive care that is unlikely to change the outcome can be difficult to achieve, particularly in institutions that do not specialize in stroke care."

The researchers examined data from 355 hospitals in California over the six year period from 2005 to 2011. The team chose California because the state was one of only a handful that maintains records detailed enough to conduct the necessary analysis. In total, the study looked at 252,368 stroke cases.

The researchers found an extremely wide range of variation in the use of early DNRs (those placed within the first 24 hours of admission), with the lowest group of hospitals only using DNRs in an average of 2.2 percent of stroke cases, while the highest group used the orders an average of 23.2 percent of the time – a ten-fold difference. As would be expected, the hospitals with a greater percentage of DNRs generally had higher mortality rates.

The team went through and projected mortality at each hospital based on the severity of stroke, the age of the patient, and other known risk factors. Mortality was calculated with and without the expected impact from higher use of early DNR orders.

They then plotted each hospital's rank in mortality both with and without DNRs and found that there was often a wide disagreement between the two rankings. Reporting of mortality and other quality measures is often done to help identify lower quality or under-performing hospitals, and the authors categorized the bottom five percent of hospitals as being poor performers in this analysis.

As many as 28 percent of the hospitals that were ranking as poor

performers in stroke care when DNRs were not accounted for were reclassified to average performing when DNRs were taken into account. Conversely, other hospitals that were ranked as average performers were reclassified to low performing once DNRs were accounted for.

"We have this factor – early DNR utilization – that varies widely among hospitals and clearly impacts hospital mortality and rankings based on mortality, yet we lack the ability to understand when these early DNRs are used in a high quality, patient-centered fashion versus when they are not," said Kelly. "These results should be a clear indication that we need to take a 'go slow' approach when it comes to using mortality as a metric to measure quality of stroke care."

Provided by University of Rochester Medical Center

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