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Weekend hospital discharge is associated with suboptimal care and outcomes: An observational Australian Stroke Clinical Registry study

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Abstract

Background: The quality of stroke care may diminish on weekends.

Aims: We aimed to compare the quality of care and outcomes for patients with stroke/transient ischemic attack discharged on weekdays compared with those discharged on weekends.

Methods: Data from the Australian Stroke Clinical Registry from January 2010 to December 2015 ($n = 45$ hospitals) were analyzed. Differences in processes of care by the timing of discharge are described. Multilevel regression and survival analyses (up to 180 days postevent) were undertaken.

Results: Among 30,649 registrants, 2621 (8.6%) were discharged on weekends (55% male; median age 74 years). Compared to those discharged on weekdays, patients discharged on weekends were more often patients with a transient ischemic attack (weekend 35% vs. 19%; $p < 0.001$) but were less often treated in a stroke unit (69% vs. 81%; $p < 0.001$), prescribed antihypertensive medication at discharge (65% vs. 71%; $p < 0.001$) or received a care plan if discharged to the community (47% vs. 53%; $p < 0.001$). After accounting for patient characteristics and clustering by hospital, patients discharged on weekends had a 1 day shorter length of stay (coefficient = −1.31, 95% confidence interval [CI] = −1.52, −1.10), were less often discharged to inpatient rehabilitation (aOR = 0.39, 95% CI = 0.34, 0.44) and had a greater hazard of death within 180 days (hazard ratio = 1.22, 95% CI = 1.04, 1.42) than those discharged on weekdays.

Conclusions: Patients with stroke/transient ischemic attack discharged on weekends were more likely to receive suboptimal care and have higher long-term mortality. High quality of stroke care should be consistent irrespective of the timing of hospital discharge.

Keywords

Weekend, weekday, quality care, clinical indicators, outcomes, stroke, transient ischemic attack

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Introduction

Hospital admission on the weekends compared with weekday admission has been associated with increased mortality or disability and decreased quality of care for patients with ischemic stroke.[1–5] The timing of discharge has been less studied for patients with stroke than the timing of admission.[1,3,4,6] Patients being discharged from hospitals on weekends may also be affected by reduced staffing and stroke-qualified medical coverage.

The impact of weekend versus weekday timing of discharge for stroke has not been studied extensively. A small study of 2737 patients participating in Get With the Guidelines with stroke reported that weekend discharge was independently associated with a one-third reduction in the odds of receiving stroke education and weight reduction counseling.[7] Our aim was to compare quality of care and outcomes for weekend versus weekday discharge after stroke/transient ischemic attack (TIA) using data collected in the Australian Stroke Clinical Registry (AuSCR). We hypothesized that patients discharged on the weekend would be less likely to receive the recommended quality of care indicators and have worse outcomes.

Methods

For this study, data from the AuSCR from January 2010 to December 2015 obtained from 45 hospitals were used. The AuSCR was established in 2009 to routinely monitor processes of care during hospital admission and health outcomes between 90 and 180 days on consecutive acute hospitalized cases of stroke or TIA (see protocol[8] and www.auscr.com.au). To minimize selection bias, the AuSCR protocol incorporates an "opt-out" approach whereby all eligible patients are registered unless they or their next of kin nominates to have their data excluded.[9] During the study period, 3% of participants opted out of the AuSCR. Patients who were discharged from the participating hospitals, and who had not refused follow-up or "opted-out" of the registry, were followed-up centrally by trained research staff between 90 and 180 days after admission. A modified Dillman protocol was used, whereby two attempts by post were made prior to an attempt by telephone.

Date of discharge collected in the AuSCR was used to classify if patients were or were not discharged on weekends. The proportion of missing data for this variable was minimal (<1%). Time of discharge was not available in the AuSCR to determine the proportion of patients discharged after working hours. The AuSCR only includes patients admitted to a ward, rather than those discharged home from the emergency department (ED). Deaths that occurred during the acute hospital stay were excluded from this analysis.

The clinical processes of care collected in the AuSCR for this period are described in Table 2. Missing or unknown data were assumed to be negative for processes of care (proportion ranged from 0% to 8%) for the main analysis. The AuSCR is one of the few national stroke registries that monitors the prescription of antihypertensive medications at discharge.[10] Within the AuSCR data collection system, all patients with stroke or TIA, who are alive at discharge, are considered eligible to receive antihypertensive medications. This is aligned with recommendations in our National Clinical Practice Guidelines[11] whereby it is recognized that lowering blood pressure (BP) regardless of BP level has advantages in reducing overall stroke risk for secondary prevention.

At follow-up, data on health-related quality of life (HRQoL) are collected using the EuroQoL-5 dimension-3 level (EQ-5D-3L) instrument.[12] A self-reported measure of overall perceptions of health was obtained using the visual analog scale (VAS) from 0 to 100, with 0 corresponding to the worst health state imaginable and 100 corresponding to the best health state imaginable. Patient self-report of readmissions to hospital and new stroke are also recorded, including current residence.

Patients were divided into weekday and weekend discharge groups. Weekend was defined as all hours of Saturday and Sunday. Comparison of baseline characteristics between groups was performed using χ^2 tests for categorical variables and Kruskal–Wallis tests for continuous variables. Multivariable logistic regression was performed to determine the odds of receiving the clinical quality indicators when discharged on the weekend compared to weekday discharge status. Cox proportional hazards regression analysis was conducted to assess deaths within 30, 90, and 180 days. Quantile regression analysis was also conducted to investigate differences in HRQoL utility scores and length of stay. Models were adjusted for age, sex, type of stroke, ability to walk on admission (as a measure of stroke severity), and socioeconomic position. To account for correlation between patients treated within the same hospital, we adjusted for patient clustering directly in our models. Additional modeling was also undertaken to check for a sex–age interaction and time trends by including year in our models. Data were analyzed using StataIC 12.1 (StataCorp 2013, Texas).

In Australia, acute public hospitals offer 24 h, 7 days per week services for continuous demand for care.[13] Medical and nursing staff services are provided on the weekend. However, hours of weekend cover by allied health professionals can vary from hospital to hospital, by region (metropolitan or rural), and by type of health profession. Patient clinical acuity and diagnosis can also affect service provision, and access to allied

health on weekends, for example, new admissions or those who are at high risk of complications (e.g., pneumonia). Physiotherapist and occupational therapist services are often provided on the weekend (at least 1 day) and more frequently than for other allied health services such as speech pathology, dietetics, and social work.

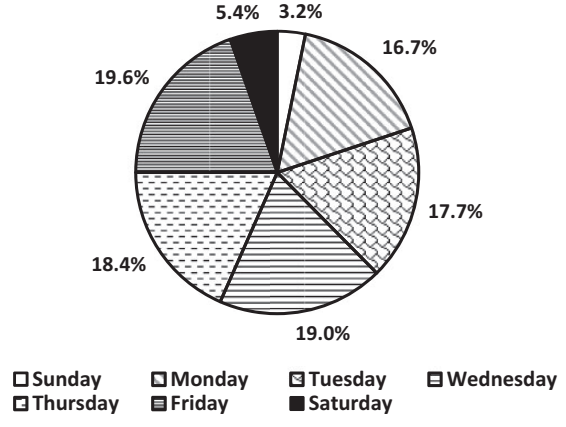
Ethics and governance approvals were obtained for all participating hospitals in AuSCR. Ethical approval was obtained from the Australian Institute of Health and Welfare to conduct data linkage to the National Death Index.

Results

Between 2010 and 2015, 33,565 episodes of hospital care were registered in the AuSCR of which 2916 (8.7%) patients died in hospital and were excluded. Of the remaining 30,649 patients with stroke or TIA, 2621 (8.6%) were discharged on the weekend (Figure 1). Compared to those who were discharged on weekdays (Table 1), those discharged on weekends were more often younger (less than 75 years) and had a TIA.

Patients discharged on weekends received less recommended clinical processes of care compared with patients discharged on weekdays (Table 2). Patients who were discharged on weekend were less likely to receive treatment in a stroke unit or receive a care plan and antihypertensive medication at discharge from hospital. In the subgroup ($n = 12{,}974$) admitted to hospitals in Queensland compared to those discharged on weekdays, those who were discharged on weekends less often received a swallow screen or assessment and less often were prescribed antiplatelets or antithrombotics medications at discharge. Irrespective of type of stroke, there was lower adherence to discharge processes of care (e.g., discharged on an antihypertensive medication) in the weekend group compared with the weekday for patients with stroke (weekend 66% vs. 71%, $p = 0.003$) and TIA (weekend 65% vs. 72%, $p < 0.001$).

Figure 1. Day of discharge.



The median length of stay for patients discharged on the weekend was lower (2 days) compared with patients discharged on a weekday (5 days; Table 3). After accounting for patient and hospital characteristics, patients discharged on weekends had a 1 day shorter length of stay. For patients discharged on weekends, those with a shorter length of stay were significantly less likely to receive the recommended clinical processes of care (online Supplementary Table 2).

The proportion of deaths was greater for patients discharged on weekends compared to weekdays (Table 3). After adjustment, patients who were discharged on weekends had a greater hazard of death up to 180 days compared with patients discharged on weekdays (Table 3 and Figure 2). Using 30-day survival analysis, where age was included as a dichotomous variable (age above or below 75 years), no interaction was found for sex–age in our model. The beta coefficient was −0.20 (95% confidence interval = −0.51 to 0.11, $p = 0.200$). When using age as a continuous variable in the same model, the interaction between sex and age was closer to significance, but there was no significant interaction. The beta coefficient was −0.00 (95% confidence interval = −0.00 to 0.00, $p = 0.050$). While close to a significant finding, it is highly unlikely that the finding is clinically meaningful. We also found no differences in the results when we adjusted for year.

In the cohort of patients who were discharged on the weekend, patients were more likely to have died within 180 days if they were older than 75 years, had a hemorrhagic stroke or were discharged to an aged care facility, while patients were less likely to have died if they were able to walk on admission (online Supplementary Tables 3 and 4). These factors were also associated with a greater hazard of death within 180 days for patients discharged on weekdays (online Supplementary Table 4). After adjustment (adding treatment in a stroke unit to the model) patients who were discharged on weekends had a greater hazard of death up to 180 days compared with patients discharged on weekdays and were also less likely to have been treated in a stroke unit. After stratification by discharge destination, we found that patients who were discharged on weekends to home had a nonsignificant greater hazard of death up to 180 days compared with patients discharged on weekdays. There were no significant differences in mortality for patients discharged on the weekend to Aged Care or Inpatient Rehabilitation (online Supplementary Table 5).

Table 1. Patient demographic and clinical characteristics.

Discharged	Weekend $N = 2621$ n (%)	Weekday $N = 28{,}028$ n (%)	p Value
Female[a]	1167 (45)	12,543 (45)	0.771
Age (in years)[a]			0.009
Less than 65	754 (29)	7428 (27)	
65–74	645 (24)	6590 (24)	
75–84	748 (29)	8389 (30)	
85+	460 (18)	5430 (20)	
Median age in years (Q1, Q3)	75 (64, 83)	74 (63, 83)	0.003
Previous stroke/TIA[b]	604 (25)	6383 (24)	0.408
Index of relative socioeconomic advantage and disadvantage			
Quintile 1	545 (21)	4916 (18)	<0.001
Quintile 2	603 (23)	6490 (24)	
Quintile 3	264 (10)	2811 (10)	
Quintile 4	492 (19)	5713 (21)	
Quintile 5	668 (26)	7648 (28)	
Type of stroke[a]			<0.001
Hemorrhagic	230 (9)	2982 (11)	
Ischemic	1347 (51)	18,366 (66)	
TIA	910 (35)	5417 (19)	
Undetermined stroke	130 (5)	1233 (4)	
Transfer from another hospital	304 (12)	3679 (13)	0.029
In-hospital stroke	101 (4)	1281 (5)	0.096
Stroke severity			
Able to walk on admission[b]	1308 (55)	11,150 (43)	<0.001

Q1: 25th percentile; Q3: 75th percentile; Quintile 1 representing the most socioeconomically disadvantaged patients and quintile 5 the most advantaged patients. TIA: transient ischemic attack.
[a]≤1% missing/not documented data.
[b]≤10% missing/not documented data.

After accounting for patient and hospital characteristics, patients discharged on the weekend were less often discharged to inpatient rehabilitation, and more likely to be discharged home. There were 22,528 patients who were eligible for follow-up at 90–180 days after stroke. Of these patients, 15,815 (70%) provided survey data at follow-up. Compared to patients who were discharged on weekdays, those who were discharged on the weekend reported fewer problems with mobility, self-care, undertaking usual activities, pain/discomfort, and

Table 2. Weekend discharge and quality of care.

Discharged	Weekend $N = 2621$ n (%)	Weekday $N = 28,028$ n (%)	Unadjusted odds ratio (95% CI)
Treated in a stroke unit	1819 (69)	22,733 (81)	0.53 (0.48, 0.58)*
Received thrombolysis, if an ischemic stroke	147 (11)	2001 (11)	1.00 (0.84, 1.20)
Discharged on an antihypertensive medication	1667 (65)	19,836 (71)	0.74 (0.68, 0.81)*
Discharged to the community with a care plan	832 (47)	8209 (53)	0.78 (0.70, 0.86)*
Queensland-only processes of care[a]	$N = 1059$	$N = 11,915$	
Mobilized during admission	738 (92)	8576 (86)	2.02 (1.55, 2.64)*
Swallow screen or assessment	620 (63)	9474 (86)	0.28 (0.25, 0.33)*
Aspirin within 48 h, if ischemic	669 (73)	7537 (75)	0.87 (0.75, 1.02)
Discharged on antithrombotic medication, if ischemic	736 (81)	8583 (89)	0.66 (0.55, 0.79)*

[a]Only collected in Queensland hospitals (2012–2015).
*$p < 0.05$.

anxiety or depression (Table 3). Compared to patients who were discharged on weekdays, those who were discharged on the weekend reported marginally better quality of life (not a clinically relevant difference) at follow-up as measured by the EQ-5D-3L.

Discussion

We present unique Australian data to investigate the relationship between weekend discharge of patients with stroke/TIA and quality of care, and long-term outcomes with implications for local hospital review and systems improvement. We found that patients with stroke/TIA discharged on weekends were less likely to receive recommended clinical processes of care. Weekend discharge was also associated with greater mortality within 180 days, but conversely had marginally better self-reported quality of life among survivors.

Our results highlight that stroke care in Australia is variable and that nonclinical characteristics, such as timing of discharge, may influence the quality of care received by patients with stroke/TIA. We have identified a patient subgroup (e.g., patients discharged on the weekend) who are at risk of not receiving recommended clinical processes of care. In a study by Starr et al.[7] in the United States of 2737 stroke admissions, patients discharged on weekends were less likely to receive evidence-based education and weight reduction counseling after stroke.[7] Our study provides additional data that patients who were not treated in a stroke unit were more likely to be discharged on a weekend (with a lower chance of receiving other evidence-based discharge processes of care). More importantly, these patients who were discharged on the weekend were less likely to receive important discharge quality of care processes such as antihypertensive medication. We have also shown that patients with short lengths of stay who were discharged on the weekend received fewer recommended clinical processes of care (or had missed opportunities for receiving quality care).

Differences in mortality by timing of discharge for patients with stroke/TIA have not been studied previously in Australia. The hazard of death at 180 days poststroke/TIA among those discharged on the weekend was 1.22 times the hazard of death among those discharged on weekdays. When we compared mortality by type of stroke/TIA, we found a higher hazard of death for patients with stroke than TIA (Figure 2). Exploration of factors associated with mortality up to 180 days for patients discharged on the weekend was similar to patients discharged on a weekday (online Supplementary Tables 1 and 2). These factors included older age, ability to walk on admission, and whether the patient was discharged to an aged care facility. The known characteristics of patients do not explain the differences in proportions of death based on day of discharge. Therefore, the difference in the 180-day mortality may be attributed to unmeasured patient characteristics relevant to weekend discharge including patients having certain nonvascular diseases, psychosocial issues or not complying with medical advice. For example, stroke patients with advanced cancer or kidney disease may

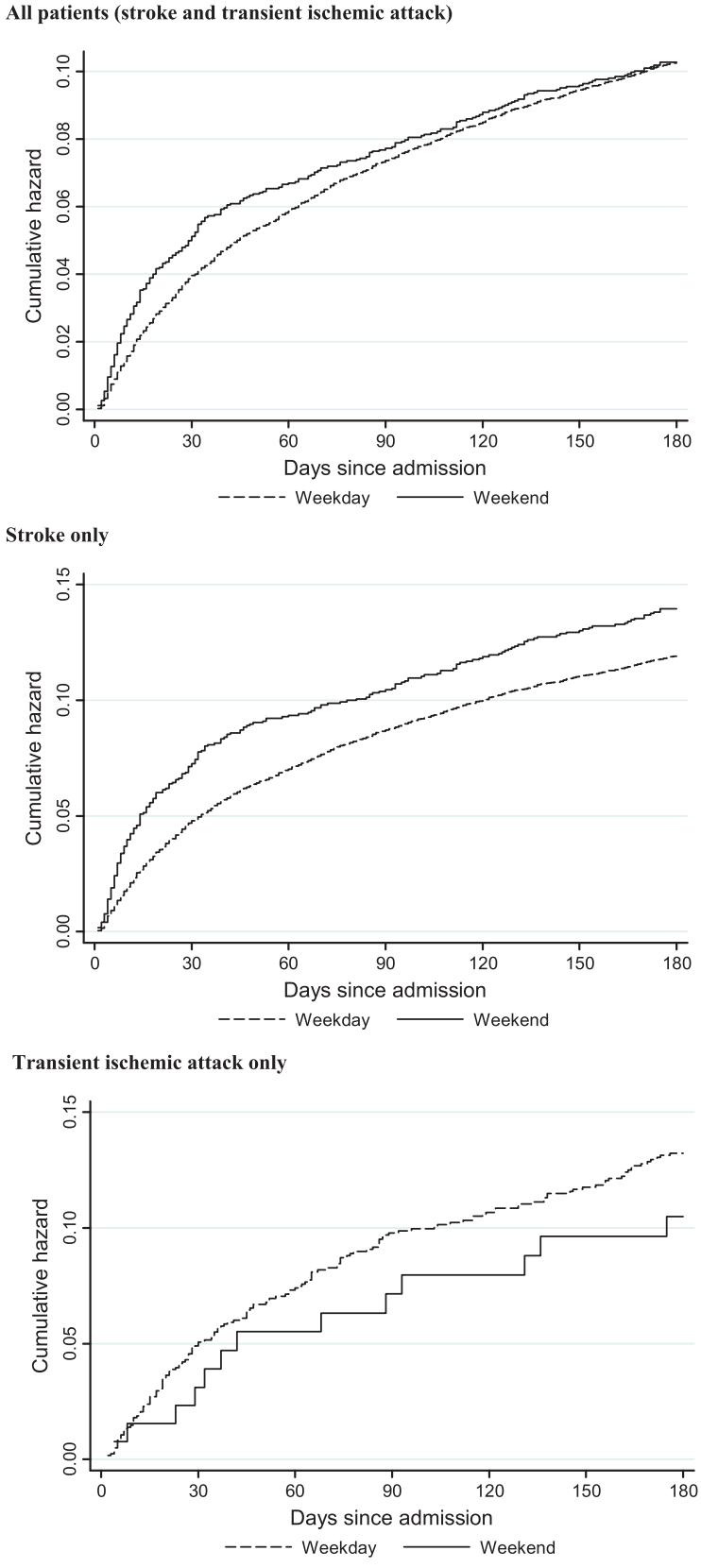
Table 3. Weekend discharge and patient outcomes.

Discharge	Weekend $N = 2621$ n (%)	Weekday $N = 28,028$ n (%)	Estimates[a] (95% CI)
Died[b]	377 (14)	4372 (15)	
Within 30 days	131 (5)	1090 (4)	HR: 1.89 (1.49, 2.40)
Within 90 days	195 (7)	1991 (7)	HR: 1.46 (1.21, 1.76)
Within 180 days	257 (10)	2739 (10)	HR: 1.22 (1.04, 1.42)
Discharge destination[b]			
Home	1688 (66)	13,971 (50)	OR: 1.68 (1.56, 1.86)
Aged care	93 (4)	1506 (5)	OR: 0.79 (0.62, 0.94)
Rehabilitation setting	331 (13)	8162 (29)	OR: 0.39 (0.34, 0.44)
Length of stay (in days)[b]			
Median length of stay (Q1, Q3)	2 (1, 6)	5 (2, 8)	Coefficient: −1.31 (−1.52, −1.10)
Outcomes at 90- to 180-day follow-up	**$N = 1272$**	**$N = 14,241$**	**p Value**
EQ-5D-dimensions[b]			
Mobility	598 (47)	7378 (52)	0.001
Self-care	298 (24)	4420 (31)	<0.001
Usual activities	598 (48)	8113 (57)	<0.001
Pain/discomfort	558 (44)	6795 (48)	0.015
Anxiety/depression	510 (41)	6335 (45)	0.004
EQ-5D VAS			
Median (Q1,Q3)	75 (60, 88)	71 (50, 85)	<0.001
Readmission[c]	275 (22)	2830 (20)	0.14
Due to another stroke	57 (21)	500 (18)	0.19
Location of survivor at time of follow-up[c]			
Living alone	258 (20)	3065 (22)	0.48
Living at home	1116 (89)	11,788 (84)	<0.001

Q1: 25th percentile; Q3: 75th percentile; VAS: visual analog scale; EQ-5D: EuroQol: Five dimensions questionnaire; OR: odds ratio; HR: hazard ratio.
[a]Adjusted for age, sex, type of stroke, ability to walk on admission (measure of stroke severity), transfer from another hospital and socioeconomic position including patient clustering.
[b]≤10% missing/not documented data.
[c]≤1% missing/not documented data.

not be admitted to a stroke unit but could be managed elsewhere in the hospital or may be discharged home. In Australia, rehabilitation facilities do not usually take admissions over the weekend so the proportion of discharges to rehabilitation being lower at the weekend may simply reflect this and not lack of provision of rehabilitation. Although equally, one might consider that given that this practice exists, those discharged on the weekend were less likely to have access to rehabilitation irrespective of clinical need.

Figure 2. Survival by period of discharge.



Our analyses are consistent with the literature on hospital admission for patients with ischemic stroke on the weekends compared with weekday admission being associated with poorer outcomes and decreased the quality of care.[1–5] The literature on hospital weekend admission and discharge are suggesting that acute hospitals employ different staff and larger number of staff Monday to Friday (weekdays) compared to Saturday and Sunday (weekends) including running of training (Monday to Friday) and so engagement in quality of care/translation of guidelines into practice may differ. This may lead to poorer outcomes for patients both admitted (previous research[1–5]) and discharged (our study) on weekends, and as such, policy and practice recommendations for this change are warranted. In our study, we found a fivefold variation in discharges on weekends across hospitals (3%–16%), which requires further investigation. Potential influences include the need to "free up" stroke beds in some hospitals on weekends or under-staffing on weekends. However, a number of studies found an association between weekend admission and mortality that was unexplained by hospital medical staffing.[14] Bray et al.[15] studied stroke outcomes using a clinical database with case-mix adjustment, but found no increase in mortality among those admitted during weekends.

A limitation of this study is that the proportion of patients discharged on weekends was low (8.6%) but there were 2621 patients. We are also unable to exclude from the dataset the patients who have been discharged on the weekend or weekday to a hospice or a palliative care service. We found in our study that patients discharged on the weekend were more likely to be discharged home than transferred to another hospital, rehabilitation unit or aged care facility. This implies a greater level of functional independence, and we may not have been able to fully adjust for variation in stroke severity. Being discharged to home is potentially problematic when patients are leaving hospital on weekends without the information to cope in the community including secondary prevention medication, rehabilitation follow-up and care plans. We are unable to report whether follow-up by the hospitals in these cases occurred soon after discharge, that is, as outpatients and if secondary prevention was initiated later. A further limitation of the AuSCR is that we do not collect information on the number of patients with hemorrhagic transformation (~8% of all ischemic strokes).[16] We agree that patients with this type of stroke may be discharged from the hospital on day 7 with plans to restart an antithrombotic in 14 days if clinically stable. The difference would affect the overall proportion of patients discharged with antithrombotics. Intuitively, we think the proportion would be similar between the groups of patients discharged on weekend or weekday. As stroke severity (indicated by ability to walk on admission) was less severe in the weekend discharge group, a priori we would consider that this situation would be more likely to occur in the weekday discharge group.

The strength of the AuSCR is that it provides consecutive data on a large cohort with 90- to 180-day patient outcomes. It also has good coverage of the Australian population. This dataset has a large sample size allowing subgroup analyses. The date of discharge variable recorded within the AuSCR is reliable (excellent inter-rater reliability $\leq 2\%$ disagreements) and complete (<1% incomplete).[17] Hour of the day is not collected in the AuSCR, so weekend was defined as only Saturday or Sunday. Evenings and holidays may have similar reduced staffing and medical coverage, and these were not accounted for in our analysis. A strength of our study is the capability of the AuSCR to link with national death registration data to ensure accuracy and completeness of mortality data. The AuSCR is a voluntary registry, and we acknowledge that our analysis could over-represent large hospitals with stroke units. Limitations of this study include that the AuSCR does not collect information on the number of contacts with health professionals, the time and date of those contacts or the type of health professionals seen while in hospital.

Future studies should provide an opportunity for quality improvement in educating patients with stroke/TIA before discharge on weekends. Acknowledging limitations of hospital resources, a recommendation to improve hospital discharge care processes could include hospital staff preparing for known weekend discharges during the working week and on-call discharge officers be available on the weekend. Hospitals with a high number of weekend discharges should also be targeted to improve the proportion of patients discharged on weekends receiving important discharge processes of care (including care plans and secondary prevention medications), an important factor for accessing evidence-based care and improving mortality outcomes.[18] There is also growing evidence that the discharge quality of care processes received by patients in hospital can directly influence long-term outcomes such as survival- and health-related quality of life up to 180 days.[19]

Conclusion

We found that patients with stroke/TIA discharged on weekends were more likely to receive suboptimal discharge care and have increased risk of death. Irrespective of the timing of discharge, every effort needs to be made to provide patients with stroke/TIA with high quality of care. Future research is required to better understand factors related to outcomes and

ensure quality care improvement across the entire week for all patients with stroke/TIA in Australia.

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SUPPLEMENTAL MATERIAL

Weekend hospital discharge is associated with sub-optimal care and outcomes: an observational Australian Stroke Clinical Registry Study

Supplemental results

Supplemental co-investigators and other contributors to the Australian Stroke Clinical Registry

Supplemental results

Table I: Weekend discharge and quality of care (excluding missing data and by stroke type)

	Exclude missing or unknown			TIA only			All strokes		
Process of care	**Weekend N=2621 n (%)**	**Weekday N=28028 n (%)**	**p-value**	**Weekend N=910 n (%)**	**Weekday N=5417 n (%)**	**p-value**	**Weekend N=1711 n (%)**	**Weekday N=22611 n (%)**	**p-value**
Treated in a stroke unit	1819 (71)	22733 (83)	<0.001	497 (55)	3697 (68)	<0.001	1321 (77)	19033 (84)	<0.001
Received thrombolysis, if an ischemic stroke	147 (11)	2001(11)	0.97	na	na	na	147 (11)	2001 (11)	0.98
Discharged on an antihypertensive medication	1672 (72)	19897 (78)	<0.001	597 (66)	3816 (71)	0.003	1070 (65)	16018 (72)	<0.001
Discharged to the community with a care plan	532 (33)	3920 (24)		361 (43)	2360 (48)	0.012	471 (50)	5848 (55)	0.001

TIA: transient ischemic attack; na: not applicable

Table II: Length of stay and quality of care (weekend discharge only)

Weekend only	**Median length of stay (Q1, Q3)**		
Process of care	**Yes**	**No**	**p-value**
Treated in a stroke unit	3 (2,6)	1 (0,3)	<0.001
Discharged on an antihypertensive medication	2 (1,4)	2 (1,3)	<0.001
Discharged to the community with a care plan	3 (1,6)	2 (1,5)	<0.001

Table III: Patient demographic and clinical characteristics by mortality status within 180 days (Weekend only discharges)

Died within 180 days	**Yes N=257** n (%)	**No N=2344** n (%)	**p-value**
Male	129 (50)	1305 (56)	0.09
Aged 75 years or more	199 (77)	1009 (43)	<0.001
Type of stroke			
Hemorrhagic	47 (18)	183 (8)	<0.001
Ischemic	164 (64)	1183 (50)	
TIA	33 (13)	877 (37)	
Undetermined stroke	13 (5)	117 (5)	
Australian born	154 (60)	1560 (66)	0.052
Indigenous background*	0 (0)	35 (2)	0.049
English spoken	2104 (94)	22654 (92)	0.985
Previous stroke/TIA	70 (30)	534 (24)	0.065
Index of relative socio-economic advantage and disadvantage			
Quintile 1	60 (24)	485 (21)	0.37
Quintile 2	61 (25)	542 (23)	
Quintile 3	19 (8)	245 (11)	
Quintile 4	50 (20)	442 (19)	
Quintile 5	57 (23)	611 (26)	
Transfer from another hospital	30 (12)	274 (12)	0.97
In-hospital stroke	101 94)	1281 (5)	0.09
Stroke severity			
Able to walk on admission	49 (20)	1259 (59)	<0.001
Discharge destination			
Home	66 (28)	1622 (70)	<0.001
Aged care	27 (11)	66 (3)	<0.001
Rehabilitation setting	35 (15)	296 (13)	0.39
Length of stay (21 days or more)	24 (9)	75 (3)	<0.001

*Identifies as Aboriginal and/or Torres Strait islander; Q1: 25th percentile; Q3: 75th percentile; Quintile 1 representing the most socio-economically disadvantaged patients and quintile 5 the most advantaged patients; TIA: Transient ischemic attack

Table IV: Patient and clinical characteristics associated with deaths within 180 days by timing of discharge

Characteristics	Weekend HR (95% CI)	Weekday HR (95% CI)
Male	0.94 (0.71, 1.24)	0.93 (0.86, 1.01)
Aged 75 years or more	**3.21 (2.31, 4.47)**	**2.96 (2.67, 3.28)**
Hemorrhagic stroke	**2.42 (1.70 , 3.43)**	**1.37 (1.22, 1.53)**
Australian born	0.79 (0.59, 1.04)	1.02 (0.94, 1.11)
Previous stroke	1.17 (0.87, 1.58)	**1.26 (1.16, 1.37)**
Able to walk on admission	**0.31 (0.22, 0.43)**	**0.31 (0.28, 0.35)**
Discharged to aged care	**1.59 (1.02, 2.48)**	**2.76 (2.48, 3.07)**
Length of stay (21 days or more)	1.48 (0.91, 2.42)	**1.22 (1.07, 1.38)**

HR: Hazard Ratio; CI: confidence interval

Table V: Discharge destination associated with mortality status within 180 days by timing of discharge

Discharge	Weekend n (%)	Weekday n (%)	HR (95% CI)
Home			
Died within 30-days	14 (1)	95 (1)	1.42 (0.64, 3.16)
Died within 90-days	41 (2)	271 (2)	1.35 (0.96, 1.89)
Died within 180-days	66 (4)	488 (3)	1.18 (0.89, 1.56)
Aged Care			
Died within 30-days	13 (14)	224 (15)	1.09 (0.49, 2.44)
Died within 90-days	20 (22)	409 (27)	0.87 (0.49, 1.55)
Died within 180-days	27 (36)	541 (36)	0.86 (0.55, 1.35)
Inpatient rehabilitation			
Died within 30-days	7 (2)	116 (1)	1.35 (0.55, 3.30)
Died within 90-days	19 (6)	428 (5)	0.99 (0.52, 1.87)
Died within 180-days	35 (11)	684 (8)	1.11 (0.85, 1.46)

HR: Hazard ratio

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