

Emergency Pharmacists Respond to Code Stroke: Impact on Time to Thrombolysis

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BACKGROUND

- The timely and accurate screening of patients and administration of intravenous tissue-type plasminogen activator (IV-tPA) remains a challenge for acute stroke teams, which traditionally consist of nurses and physicians.
- A role and credentialing program for pharmacists to attend acute stroke call-outs was developed based on a previously reported Australian initiative.¹ The role included obtaining a rapid medication history, assisting with IV-tPA dosing and administration, and review of medicines with a formalised medication management plan (MMP) (see Figure 1).
- This model was implemented at a major thrombolysis centre in New South Wales, from November 2016.

AIM

- To assess the impact of a pharmacist on door-to-needle (DTN) time for thrombolysis in ischaemic stroke, as well as the proportion of patients with an MMP within 24 hours of admission.
- To determine the value and acceptability of a pharmacist role to other clinicians in the acute stroke team.

METHODS

- A pre- and post-interventional study design was used.
- During the post-interventional period (November 2016-June 2017), details of all stroke call-outs were recorded prospectively. Pre-interventional data was accessed retrospectively from electronic medical records, for thrombolysed patients only (March-October 2016).
- The primary outcome was mean difference in DTN time, before and after pharmacists' involvement in stroke call-outs.
- A questionnaire was completed by team members in February 2017, evaluating the pharmacists' contribution.
- Comparative data was analysed using an unpaired t-test or Fisher's exact test with Graphpad[®] software.

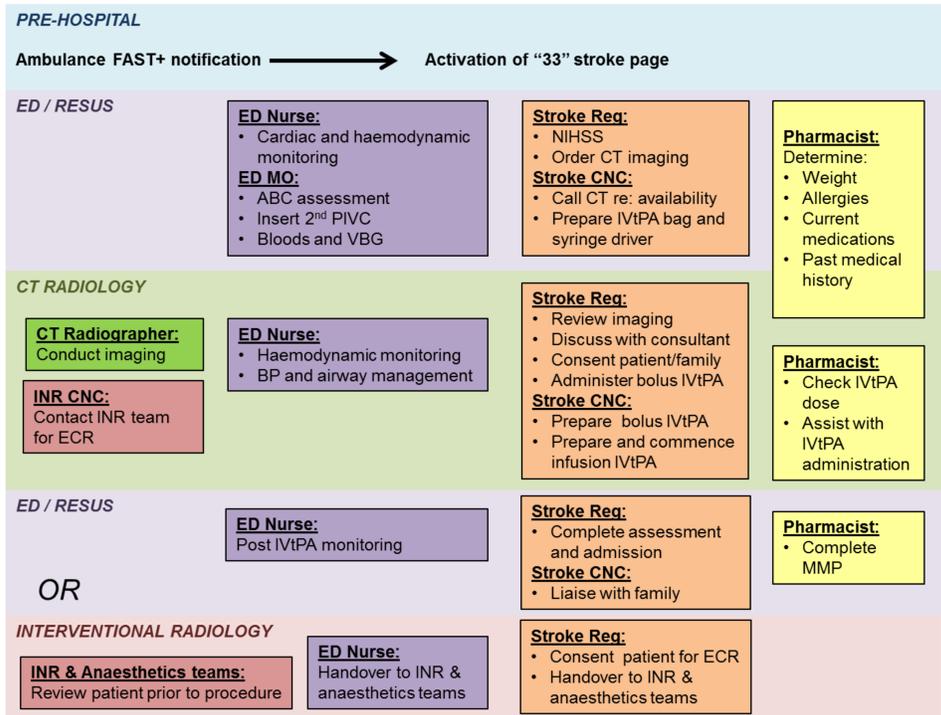


Figure 1. Acute stroke team roles and responsibilities

ED = emergency department; CT = computerised tomography; NIHSS = National Institute of Health Stroke Scale; INR = interventional neuroradiology; CNC = clinical nurse consultant; ECR = endovascular clot retrieval; IVtPA = intravenous tissue-type plasminogen activator; MMP = medication management plan

Table 1. Impact of a pharmacist on door-to-needle time & early medication review

DTN = door-to-needle; IVtPA = intravenous tissue-type plasminogen activator; MMP = medication management plan
*unpaired t-test #Fisher's exact test

	PRE (IVtPA n=66)	POST (n=224; IVtPA n=64)	P-value
No. of call-outs attended by pharmacist (%)	-	126 (56.5)	-
Mean (SD) DTN time (minutes)	59.2 (38.0)	49.1 (25.1)	0.1*
Mean (SD) DTN time during pharmacist working hours (minutes)	56.9 (41.0)	40.9 (19.3)	0.07*
No. MMP (%)	33 (50.0)	162 (72.6)	0.0009#
No. MMP ≤24 hours (%)	4 (6.1)	122 (54.7)	0.0001#

DISCUSSION

- Results are potentially confounded by other initiatives undertaken in 2016 to optimise DTN time, including education of emergency staff, education regarding inpatient stroke recognition and improvements in anticoagulation assay turnaround times.
- The significant increase in proportion of patients with a pharmacist MMP ≤ 24hrs is likely to translate to a reduction in medication errors and associated harm.²
- Future directions include extending hours of pharmacist service and possible expansion of the pharmacists' role to include partnered prescribing.

CONCLUSION

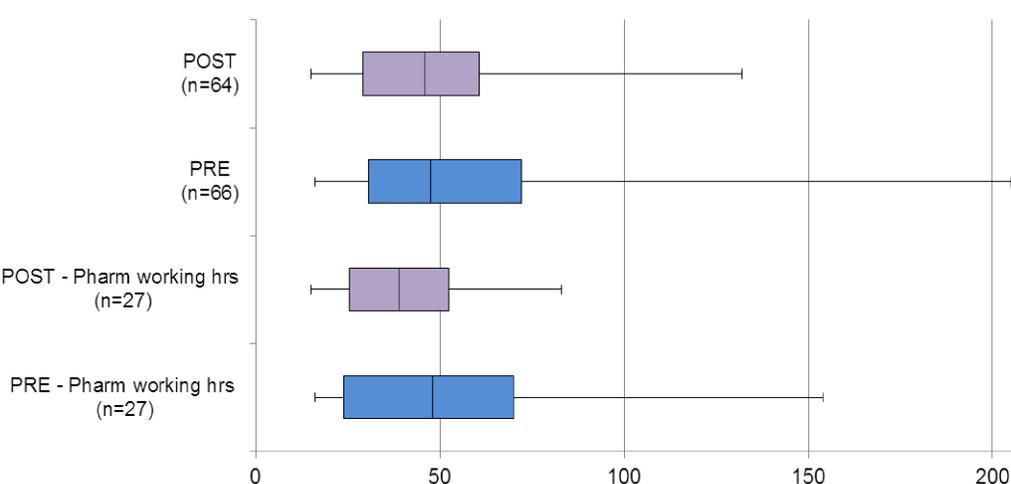
The contribution of trained pharmacists to acute stroke call-outs may positively impact on DTN time, and increase the proportion of patients with early medication review. However, larger controlled studies are required to further evaluate this model.

1) Roman C, Mitra B, Zavala J, Dooley M. Acute stroke callout and the Emergency Medicine Pharmacist [Presentation]. Proceedings of the 41st National Conference of The Society of Hospital Pharmacists of Australia; 2015 Dec 3-6; Melbourne, Victoria.
2) Buckley MS, Harinstein LM, Clark KB et al. Impact of a clinical pharmacy admission medication reconciliation program on medication errors in "high-risk" patients. Ann Pharmacother, 2013;47:1599-1610.



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RESULTS

- Patients had a median (range) age of 76 (38-97) years pre-intervention and 77 (23-98) years post-intervention.
- Thrombolysed patients had a median (range) National Institute of Health Stroke Scale (NIHSS) of 10 (2-24) pre-intervention and 8 (0-27) post-intervention.
- Stroke call-outs were attended by one of six credentialed pharmacists.
- There was a small, but non significant reduction in DTN, and a significant increase in MMPs ≤24 hours (See Figure 2 and Table 1).
- All survey respondents (8/8) agreed or strongly agreed that pharmacists added value to the team.
- All (8/8) considered 'obtaining a timely medication history' to be the most valuable role. Other tasks identified to be of value to stroke team members included 'interpretation of anticoagulant assays,' 'obtaining past medical history' and 'assistance with blood pressure and glucose management.'