ACE agency for care effectiveness

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NiU National Improvement Unit Singapore | NKF | Singapore General Hospital SingHealth

Streamlining access: Reducing Hospital Referrals for Tunnelled Haemodialysis Catheter

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AIM: To reduce the number of THC (tunnelled haemodialysis catheter) dysfunction referrals from community dialysis centres to public healthcare institutions (PHIs) from a baseline median of 48 to 34 cases per month in 13 months

BACKGROUND: THC dysfunction is a major problem in end stage kidney failure patients, with 17-33% of THCs requiring removal. Thrombosis is a common cause of THC dysfunction which can be treated with lytic dwell. In Singapore, the administration of lytic dwell to restore the flow of occluded THC is traditionally performed in acute hospitals as an inpatient procedure, resulting in delay in dialysis, inconvenience to patients, increased hospital bed occupancy and overall healthcare costs.

METHODS: We implemented a multifaceted quality improvement intervention in 40 community dialysis centers (DCs) using a stepped wedge, non-randomized design over 12-months consisting of education, audit and feedback and peer support. The QIC involved:

1. **C**atheter flow restoration with **L**ytic dw**E**ll at community di**A**lysis cent**R**e **(CLEAR):** upskilling dialysis nurses to administer lytic agent to treat THC dysfunction in community DCs (Fig. 1 & 2)
2. Optimising **B**lood flow, **L**ocking solution, **A**nticoagulant and **S**tandardising **T**echnique **(BLAST):** adopting measures from best practices to prevent THC dysfunction in community DCs (Fig.1)

Fig. 1: Theory of improvement (CLEAR & BLAST)

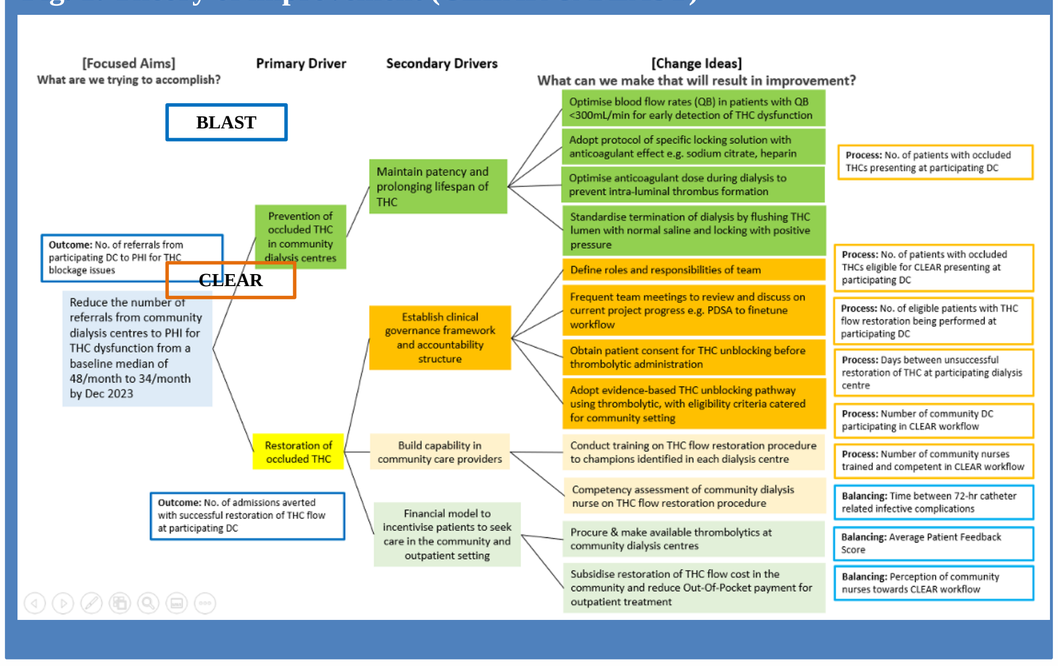
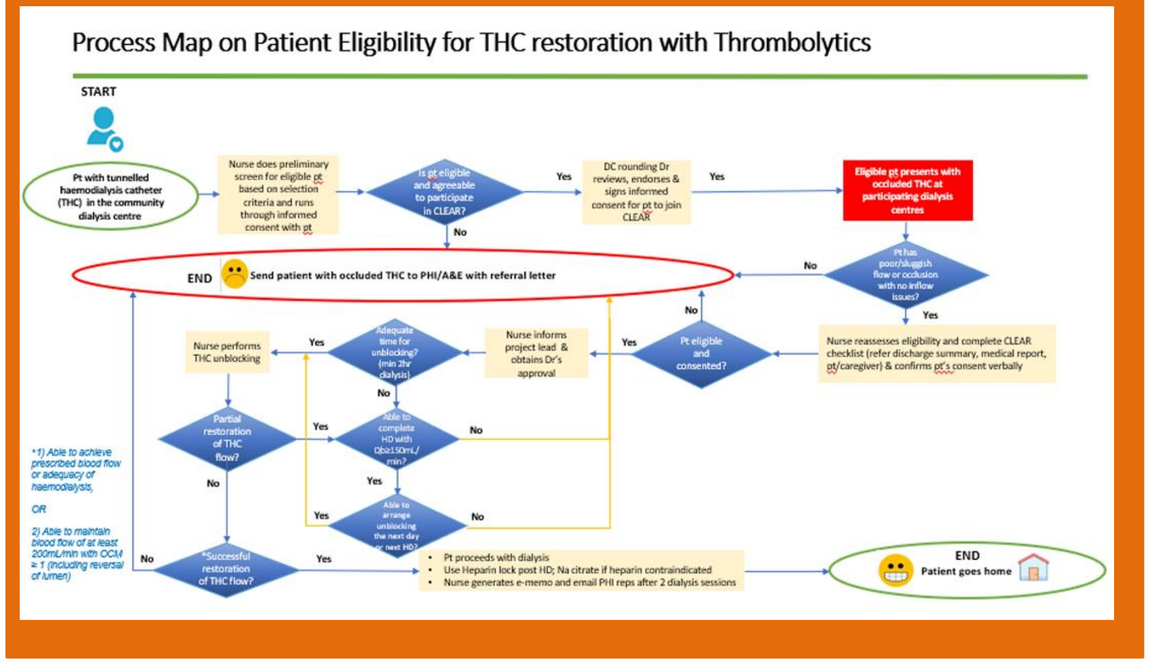


Fig. 2: Process map (CLEAR)



Decision tree model was constructed using TreeAge Pro 2024 to estimate the incremental costs associated with CLEAR initiative.

RESULTS: One hundred community dialysis nurses received training to instill thrombolytic agents to restore flow of malfunctioned THC. A total of 64 restorations was done at NKF centres of which 56 admissions were successfully averted (87.5%) from December 2023 to December 2024. The number of referrals to acute hospitals THC dysfunction reduced from a baseline median of 48 to 34 (Fig.3). The treatment was well received by patients. There was no 72-hr catheter-related infective complications reported during the project duration. In the cost analysis comparing CLEAR initiative at a community DC (intervention) with catheter flow restoration with lytic dwell at acute hospital (usual care), the average cost for treating 100 patients with the intervention is $207,705. In contrast, the usual care costs S$465,744 for the same number of patients, indicating a cost-saving of S$258,038 when opting for the intervention. Probabilistic sensitivity analysis (PSA) indicates that the probability of the intervention being cost saving is more than 99%. (Table 1) **:**

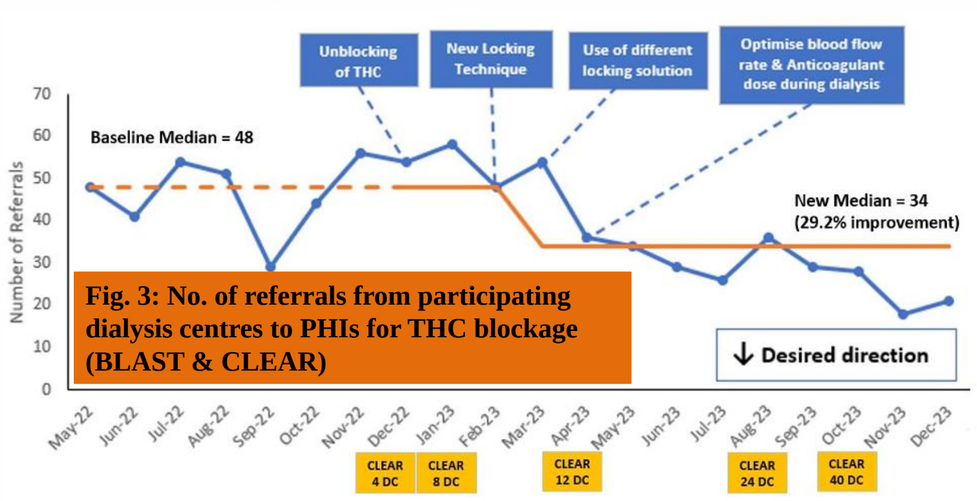


Fig. 3: No. of referrals from participating dialysis centres to PHIs for THC blockage (BLAST & CLEAR)

	Average cost[#] (95% CI)	Incremental cost[#] (95% CI)	Probability of the intervention being cost saving
Intervention	$207,705 (166,102 to 253,634)	-$258,038 (-357,557 to -159,369)	>99%
Usual care	$465,744 (378,727 to 562,508)		

Table 1: Cost analysis results comparing the intervention and the usual care
[#] Results are presented for 100 patients.

CONCLUSIONS: Our project demonstrated that transition away from inpatient care may improve patient outcomes and reduce burden to the healthcare system.

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