

# Use of a Thrombolytic in Restoring Function of a Central Venous Catheter



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## Goal

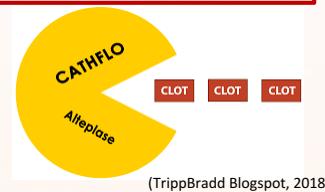
To close the gap between policy and current practice, and increase the incidences of catheter restoration by clarifying the best practice of administration of a thrombolytic when used for the declotting of a central venous catheter (CVC).

## PICO

In adult medical/surgical patients with a central venous catheter, what is the effect of a 120 minute alteplase dwell time compared to a 30 minute dwell time on restoring catheter function?



(Genentech, 2014)



(TrippBradd Blogspot, 2018)

- Alteplase, a thrombolytic agent, is an enzyme that works by binding to the fibrin in a clot and converting the “entrapped plasminogen to plasmin, initiating local fibrinolysis” (Genentech Inc., 2005).
- Cathflo Activase (Alteplase) is commonly used in restoring the function of a central venous access device. The function of a CVC is assessed by the ability to draw back blood from the line.
- Current administration guidelines, according to the manufacturer, state to administer 2 ml (2 mg) of the reconstituted solution and assess the catheter patency at 30 minutes after instillation, and then at 120 minutes if the catheter was not patent at the 30 minute time mark (Genentech Inc., 2005).
- The current Maine Medical Center policy for “Declotting of CVC Using Thrombolytic” follows the manufacturer recommendations for administration and use, however it is commonly thought that Cathflo can only be left in the line for 30 minutes.



(Wikipedia, 2019)

## Current Evidence

- In an open-label trial, 995 patients with catheter occlusion were treated with alteplase. After 30 minutes 52% of catheters had restored function. After 120 minutes of dwell time, 75% of catheters had restored function (Genentech Inc., 2005).
- In a study involving 310 patients, after two instillations of alteplase for the maximum dwell time of 120 minutes, 82.9% of catheters had restored function (Blaney et al., 2006).
- In a phase III, open-label trial patients received up to two instilled doses of alteplase. After 30 minutes, 57% of catheters had restored blood flow. After the full 120 minute dwell time, 87% of catheters had restored function (Shen et al., 2003).

## Research Implications

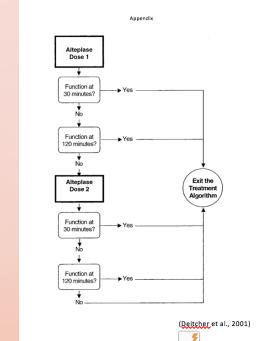
- There are currently a few studies on the effectiveness of using 1 mg of alteplase instead of 2 mg, however a conclusion of the effectiveness had not yet been reached. More research on lower and higher doses of alteplase on the effect of restoring the patency of a central line could be conducted in order to determine the optimal dose of alteplase.
- Additionally there is little research on the effects of optimal dwell time of alteplase. Although research on dwell times under 120 minutes has been conducted, the implications of leaving alteplase in the line over 120 minutes is not readily available.

## Clinical Implications

Evidence shows that after letting the Cathflo Activase (Alteplase) dwell for thirty minutes, there was a high rate of catheter restoration. However, there was an even higher rate of catheter restoration after the 120 minute dwell time. If the catheter is patent and has good blood return, the alteplase can be removed from the line. However, if the line still has no blood return, the alteplase can be left in the line for an additional 90 minutes. During this extra 90 minutes of dwell time, there is a significant number of additional catheters with restored function (Genentech, Inc., 2005). This additional dwell time is important to implement into practice in order to effectively administer the medication and achieve optimal results in regards to restoring the function of a CVC.

## Recommendations

In order to reduce the gap between the current MMC policy, research-based practice, and the current practice of the unit, it would be beneficial to make the policy/appendix regarding declotting a CVC with a thrombolytic clearer. An example treatment algorithm could look like:



Other recommendations to promote the best-practice use of alteplase on the unit include the creation of a medication administration guideline, staff trainings, and the use of the PICC team as a resource.