# Administration of Alteplase in Acute Ischemic Stroke

## Dosage and administration

Once the pre-thrombolysis checklist has been completed and the decision to thrombolyse a patient has been made by the on-call Neurology team, alteplase must be administered by suitably trained registered nurses in the Emergency Department (CED) Intensive Care Unit (PICU), or 26a Neuro IOA as per doctor's orders.

The recommended dose is **0.9 mg/kg body weight** (maximum 90 mg) given in 2 parts:

- 10% of the total dose administered as an initial IV bolus
- followed by the remaining 90% of reconstituted alteplase administered as an IV infusion over 60 minutes

Alteplase infusion must be administered via an Alaris pump using the Guardrails drug library.

The **total dose of alteplase** used for the treatment of acute ischemic stroke **must not exceed 90 mg**.

## Dose

1. Identify approximate weight of patient. Use dosing table on page 3 to obtain total dose (max dose = 90 mg).

2. Reconstitute alteplase to a concentration of 1 mg/mL – 50 mg vial with 50 mL or 10 mg with 10 mL (water for injections) siluent using the transfer cannula provided.

3. For patients weighing > 55 kg, use a combination of 50 mg and 10 mg vials, if possible to avoid wastage and increased costs.

4. Withdraw bolus dose and administer as an IV push.

5. Administer infusion dose via Alaris infusion pump, priming tubing with alteplase solution.

6. Flush line with sodium chloride 0.9% after completion of infusion.

## Reconstitution




**Alteplase should NOT be mixed with other drugs, neither in the same infusion vial nor the same venous line (NOT even with heparin).**

## Adjunctive therapy

The safety and efficacy of alteplase with concomitant administration of heparin, clopidogrel or aspirin during the first 24 hours after the symptom onset has not been investigated sufficiently. Therefore administration of aspirin, clopidogrel or intravenous heparin should be avoided in the first 24 hours after treatment with alteplase. If heparin is required for other indications (eg prevention of deep vein thrombosis) the dose should not exceed 10,000 units per day, administered subcutaneously.

## Monitoring and observations during and after alteplase infusion

All patients will be admitted under the Neurology service post alteplase infusion.

Full neurological observations, including temperature, pulse, blood pressure, Glasgow Coma Scale, pupils and limb power are to be recorded during the first 24 hours as follows:

- Every 15 minutes from start to finish of infusion
- Then hourly for 4 hours
- Then 2 hourly for the next 4 hours
- Then 4 hourly until reviewed

**A repeat CT scan should be performed at 24 hours post Alteplase administration.**

| Patient Weight (kg) | Total dose @ 0.9/mg/kg (mg) | Vol. of 1mg/1ml t-PA | | Patient Weight (kg) | Total dose @ 0.9/mg/kg (mg) | Vol. of 1mg/1ml t-PA | |
|---|---|---|---|---|---|---|---|
| | | 10% Bolus (ml) | 90% Infusion (ml) | | | 10% Bolus (ml) | 90% Infusion (ml) |
| 10 | 9.0 | 0.9 | 8.1 | 55 | 49.5 | 5.0 | 44.5 |
| 11 | 9.9 | 1.0 | 8.9 | 56 | 50.4 | 5.0 | 45.4 |
| 12 | 10.8 | 1.1 | 9.7 | 57 | 51.3 | 5.1 | 46.2 |
| 13 | 11.7 | 1.2 | 10.5 | 58 | 52.2 | 5.2 | 47.0 |
| 14 | 12.6 | 1.3 | 11.3 | 59 | 53.1 | 5.3 | 47.8 |
| 15 | 13.5 | 1.4 | 12.1 | 60 | 54.0 | 5.4 | 48.6 |
| 16 | 14.4 | 1.5 | 12.9 | 61 | 54.9 | 5.5 | 49.4 |
| 17 | 15.3 | 1.6 | 13.7 | 62 | 55.8 | 5.6 | 50.2 |
| 18 | 16.2 | 1.6 | 14.6 | 63 | 56.7 | 5.7 | 51.0 |
| 19 | 17.1 | 1.7 | 15.4 | 64 | 57.6 | 5.8 | 51.8 |
| 20 | 18.0 | 1.8 | 16.2 | 65 | 58.5 | 5.9 | 52.6 |
| 21 | 18.9 | 1.9 | 17.0 | 66 | 59.4 | 5.9 | 53.5 |
| 22 | 19.8 | 2.0 | 17.8 | 67 | 60.3 | 6.0 | 54.3 |
| 23 | 20.7 | 2.1 | 18.6 | 68 | 61.2 | 6.1 | 55.1 |
| 24 | 21.6 | 2.2 | 19.4 | 69 | 62.1 | 6.2 | 56.0 |
| 25 | 22.5 | 2.3 | 20.2 | 70 | 63.0 | 6.3 | 56.7 |
| 26 | 23.4 | 2.4 | 21.0 | 71 | 63.9 | 6.4 | 57.5 |
| 27 | 24.3 | 2.4 | 21.9 | 72 | 64.8 | 6.5 | 58.3 |
| 28 | 25.2 | 2.5 | 22.7 | 73 | 65.7 | 6.6 | 59.1 |
| 29 | 26.1 | 2.6 | 23.5 | 74 | 66.6 | 6.7 | 59.9 |
| 30 | 27.0 | 2.7 | 24.3 | 75 | 67.5 | 6.8 | 60.7 |
| 31 | 27.9 | 2.8 | 25.1 | 76 | 68.4 | 6.8 | 61.6 |
| 32 | 28.8 | 2.8 | 26.0 | 77 | 69.3 | 6.9 | 62.4 |
| 33 | 29.7 | 3.0 | 26.7 | 78 | 70.2 | 7.0 | 63.2 |
| 34 | 30.6 | 3.1 | 27.5 | 79 | 71.1 | 7.1 | 64.0 |
| 35 | 31.5 | 3.2 | 28.3 | 80 | 72.0 | 7.2 | 64.8 |
| 36 | 32.4 | 3.2 | 29.2 | 81 | 72.9 | 7.3 | 65.6 |
| 37 | 33.3 | 3.3 | 30.0 | 82 | 73.8 | 7.4 | 66.4 |
| 38 | 34.2 | 3.4 | 30.8 | 83 | 74.7 | 7.5 | 67.2 |
| 39 | 35.1 | 3.5 | 31.6 | 84 | 75.6 | 7.6 | 68.0 |
| 40 | 36.0 | 3.6 | 32.4 | 85 | 76.5 | 7.7 | 68.8 |
| 41 | 36.9 | 3.7 | 33.2 | 86 | 77.4 | 7.7 | 69.7 |
| 42 | 37.8 | 3.8 | 34.0 | 87 | 78.3 | 7.8 | 70.5 |
| 43 | 38.7 | 3.9 | 34.8 | 88 | 79.2 | 7.9 | 71.3 |
| 44 | 39.6 | 4.0 | 35.6 | 89 | 80.1 | 8.0 | 72.1 |
| 45 | 40.5 | 4.1 | 36.4 | 90 | 81.0 | 8.1 | 72.9 |
| 46 | 41.4 | 4.1 | 37.3 | | | | |
| 47 | 42.3 | 4.2 | 38.1 | | | | |
| 48 | 43.2 | 4.3 | 38.9 | | | | |
| 49 | 44.1 | 4.4 | 39.7 | | | | |
| 50 | 45.0 | 4.5 | 40.5 | | | | |
| 51 | 45.9 | 4.6 | 41.3 | | | | |
| 52 | 46.8 | 4.7 | 42.1 | | | | |
| 53 | 47.7 | 4.8 | 42.9 | | | | |
| 54 | 48.6 | 4.9 | 43.7 | | | | |

## Reportable observations and management of possible complications

1. **Hypertension** >15% above the 95th centile for ageon repeated measures, as this increases the risk of ICH. **Cautiously** lower blood pressure:
    a. **Link to hypertension in childhood guideline.**

2. **Hypotension** may cause cerebral hypoperfusion.
    a. Stop any running hypotensive agents (eg labetalol, Hydralazine, GTN)
    b. Give a fluid bolus and call PICU

3. **Haemorrhage**. Usually presents as worsening or new neurological deficit in the first 12 hours post Alteplase administration.
    a. Stop Alteplase infusion if still in progress. There is **NO** reversal agent for Alteplase.
    b. Urgent FBC and clotting screen with prothrombin time (PT), activated partial thromboplastin time (aPTT) and fibrinogen level.
    c. Urgent CT brain scan. If Haemorrhage present, discuss with on call neurology team, on call haematologist and ask about the use of FFP/Cryoprecipitate +/- neurosurgical team (surgery not usually appropriate).
    d. Steroids and osmotherapy are usually not appropriate.

    **Note:** minor asymptomatic haemorrhage is common and does not worsen outcome. Large symptomatic haemorrhage has a poor prognosis and may be fatal.
    - Observe all body waste for suggestion of bleeding
    - Check potential bleeding sites (ie wounds, IV access, puncture sites)
    - Note: onset of abdominal pain may indicate retroperitoneal bleeding
    - Minimise physical handling of the patient to prevent bruising/bleeding
    - Safety precautions to prevent falls
    - Do not use a razor blade for shaving
    - Minimise invasive procedures
    - Leave IV leur in situ for blood taking if possible. If venepuncture is required, apply direct pressure to puncture site for 20 minutes.

4. **Allergic reaction** such as anaphylaxis. Management of peri-oral angioedema complicating Alteplase treatment.
    a. Peri-oral angioedema is an uncommon complication of Alteplase treatment in acute ischemic stroke, occurring in 1-5% of treated patients
    b. Peri-oral angiodema may occur during, or up to 2 hours after the infusion, and may be bilateral, hemilingual or contralateral to the side of the stroke.
    c. Concurrent ACE inhibitor use and insular involvement of the stroke may be risk factors.
    d. The main differential diagnosis is tongue hematoma
    e. Management is empiric, based on expert opinion.

**Suggested principles include:**

- Stop Alteplase infusion if still in progress and swelling is more than mild or is progressing rapidly.
- Monitor airway carefully
- Early anaesthetic consultation; intubation may be required for progressive airway obstruction. Tracheostomy must be avoided due to the thrombolytic effects of the alteplase.
-Link to anaphylaxis in PICU document
- Be aware that Adrenaline may induce hypertension

> Periodic examination of the patient's tongue in the latter stages of the alteplase infusion and continuing for 20 minutes after the completion of the infusion should be carried out.