NHS Blood and Transplant

Information for clinicians

Tranexamic acid in the prevention and management of blood loss

More than 60 years ago, Japanese researchers Shosuke and Utako Okamoto developed tranexamic acid (TXA) with the vision of reducing deaths from post-partum haemorrhage[1]. Today, TXA is used worldwide to minimise blood loss in surgery, trauma, and obstetrics, helping reduce the need for blood transfusion and the associated risks.

TXA is a synthetic antifibrinolytic agent: a lysine analogue that works by blocking the activation of plasminogen to plasmin, the key enzyme responsible for breaking down blood clots. By inhibiting fibrinolysis and stabilising clot formation, TXA helps preserve clot integrity and reduces bleeding and transfusion requirements[1,2].

Despite strong evidence and national guidelines supporting its use, TXA remains underutilised in many healthcare settings. Wider adoption has the potential to improve patient outcomes by reducing blood loss across multiple clinical scenarios and lowering the need for blood transfusion, thereby enhancing patient safety. In addition to clinical benefits to patients, TXA is highly cost-effective, supports Patient Blood Management (PBM) strategies and contributes to the sustainable use of scarce blood supplies.

Effective: June 2026

Indications for use in adults

Surgery (adults)

The latest update to NICE blood transfusion guideline NG24[3] and NICE quality standard QS138 statement 2 (March 2026)[2,3] simplifies when TXA should be offered during surgery. These changes aim to standardise practice, improve patient safety, and increase TXA use in line with evidence on its clinical and cost-effectiveness.

Inside an operating theatre - Offer TXA if there is any risk of bleeding and the procedure will breach the skin or mucous membrane.

Outside an operating theatre i.e. interventional radiology / A&E - Offer TXA if blood loss expected to exceed 500mls.

Initial dose

- 1 g by slow intravenous (IV) bolus over 10 minutes prior to start of surgery or
- An optional infusion of 1 g diluted in saline over 8 hours

Additional dose

- May be beneficial due to the length of surgery or volume of blood loss
- Perform risk assessment for the additional dose

Renal impairment: Adjust dose in significant renal impairment

TXA and cell salvage

NICE guideline NG24 recommends TXA is given alongside intraoperative cell salvage when used. NICE specifically advises considering intraoperative cell salvage with TXA for patients expected to lose a very high volume of blood (cardiac and complex vascular surgery, major obstetric procedures, pelvic reconstruction, and major spinal or scoliosis surgery)[2].
Standard TXA dosing recommendations for the treatment or prevention of generalised fibrinolysis should be applied.

Orthopaedic surgery

NICE Guideline NG157 recommendations for (primary) elective hip, knee or shoulder replacement[4]

On induction

- Give TXA 1 g by slow IV bolus over 10 minutes prior to starting surgery.
- For primary elective shoulder replacement TXA should be considered rather than routinely given.

After washout and before wound closure (intra-articular)

- Give 1-2 g TXA diluted with saline topically after final washout and before wound closure
- Ensure the total combined dose does not exceed 3g

Renal impairment: A reduced IV dose should be given on its own

Trauma (adults)

The CRASH 2 trial demonstrated that TXA is effective and safe in bleeding trauma patients, significantly reducing mortality. The CRASH 3 trial showed a reduction in head-injury-associated mortality in patients with mild to moderate traumatic brain injury (TBI) who received TXA. Neither study demonstrated an increase in thrombotic or vascular occlusive events. Efficacy is time-dependent, with greatest benefit when administered as early as possible and within 3 hours of injury[5,6].

Adult trauma (non-traumatic brain injury or mixed haemorrhage)

- 1st dose – 1 g by slow IV bolus over 10 minutes (ideally ≤1 hour, must be ≤3 hours of bleeding)
- 2nd dose – 1 g IV infusion over 8 hours

Traumatic Brain Injury (TBI):

- Within 3 hours of injury
- GCS ≤12 OR CT confirmed intracranial bleeding
- 1st dose – 1 g slow IV bolus over 10 minutes
- 2nd dose – 1 g IV infusion over 8 hours

Major haemorrhage (non-traumatic, adults)

The British Society for Haematology (BSH) guidelines[7] recommend the use of TXA in the management of non-traumatic major haemorrhage to reduce blood loss and reduce the need for blood component use.

- 1st dose – 1 g by slow IV bolus over 10 minutes (ideally ≤1 hour, must be ≤3 hours of bleeding)
- 2nd dose – 1 g IV infusion over 8 hours

Exceptions – Gastrointestinal bleeding

The HALT-IT trial[8] demonstrated that TXA did not reduce mortality in patients with gastrointestinal bleeding. The trial, of over 12,000 patients, found that high-dose TXA did not improve outcomes and was associated with a small increase in thromboembolic events and seizures. Therefore, TXA is not recommended for gastrointestinal bleeding.

Indications for use in obstetrics and gynaecology:

Post-partum haemorrhage (PPH)

The WOMAN trial demonstrated that early administration of TXA significantly reduces mortality due to bleeding in women with post-partum haemorrhage, without a significant increase in adverse effects. The greatest reduction in bleeding-related deaths occurred when TXA was administered within 3 hours of childbirth, and TXA should be given as soon as possible after bleeding onset[9].

- 1st dose -1 g administered by slow IV bolus over 10 minutes from onset of bleeding
- 2nd dose - If bleeding continues after 30 minutes or restarts within 24 hours, give a further 1 g IV over 10 minutes

Menorrhagia (heavy menstrual bleeding, HMB)

Oral TXA is an effective treatment for managing menorrhagia. It can be used as a standalone therapy or as part of a wider medical or surgical management plan[10].

- Start on the first day of bleeding
- Take only on days with heavy flow
- Maximum duration: usually 3–5 days per cycle
- 1 g three times daily during menstruation; may increase to four times daily if required (maximum 4 g per day)[14]

Renal impairment: Adjust dose in significant renal impairment

HRT: Avoid with combined hormonal contraception due to increased thrombosis risk

Indications for use in paediatrics:

Non-cardiac surgery

NICE NG24[2] and the Royal College of Surgeons of England[11] recommend considering TXA in children aged 1–15 years:

Inside an operating theatre - offer TXA when there is any risk of bleeding and the procedure will breach the skin or mucous membrane

Outside an operating theatre i.e. interventional radiology / A&E - offer TXA when there is an expected loss of more than 10% of their blood volume.

- 15 mg/kg (maximum 1 g) by slow IV bolus over 10 minutes prior to surgery
- Or 2 mg/kg/hr IV infusion during surgery
- Stop infusion at wound closure or when bleeding ceases
- Children aged 12 and over may receive an adult dose

Cardiac and high blood loss surgery

BSH guidelines on transfusion for fetuses, neonates and older children[12] recognises limited evidence for TXA dosing in paediatric cardiac surgery, but acknowledges the findings by Wesley et al.[13], which suggest that,

- a bolus dose followed by an infusion may be the most effective method
- that age may be a better determining factor than weight for dosing, and
- the use of cardiopulmonary bypass may also affect dosing requirements

BSH also states the use of antifibrinolytic therapy should be considered for neonates and children undergoing cardiac surgery at high risk of significant bleeding.

Follow paediatric surgical dosing above unless local cardiac protocols apply[2,13].

Major trauma

BSH guideline on transfusion for fetuses, neonates and older children[13] recommends TXA when massive blood loss is anticipated in children with major traumatic injury. Timing and dosing should align with Royal College of Paediatrics and Child Health recommendations.

Dosing regimens vary. Below is a summary of some of the dosing recommendations from the above publication and BNF advice[14]

Paediatric trauma < 12 years of age

- 15 mg/kg (maximum 1 g) by slow IV bolus over 10 minutes
- 2 mg/kg/h for up to 8 hours or until bleeding controlled

Paediatric trauma ≥12 years

- 1 g IV bolus
- 1 g IV infusion over 8 h[13]

Gynaecology (menorrhagia / HMB)

The dosing of TXA for post menarche adolescents is the same as for adults[10.]

- Start on the first day of bleeding
- Continue only on days with heavy flow
- Maximum duration: usually 3–5 days per cycle

Oral dose (child 12-17 years)

- 1 g three times daily during menstruation (maximum 4g per day) 14

Renal impairment: Adjust dose in significant renal impairment

HRT: Avoid with combined hormonal contraception due to increased risk of thrombosis

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