



## Intravenous and Topical Tranexamic Acid in Elective Major Orthopedic Surgery

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Tranexamic Acid (TXA) is a synthetic amino acid which competitively blocks the lysine binding sites on plasminogen, thereby slowing the conversion of plasminogen to plasmin [1]. For instance, the early administration of TXA has been found to confer a survival benefit in the settings of severe trauma [2] and of post-partum hemorrhage without increasing thromboembolic events [3]. Several large meta-analyses have confirmed that the intravenous administration of TXA could effectively and safely reduce perioperative blood loss and transfusion requirements in total hip and knee arthroplasty [4,5]. Moreover recent meta-analysis showed the safety and efficacy of topical tranexamic acid in total hip arthroplasty. However, they demonstrated that combined intravenous and topical tranexamic acid may be superior to intravenous or topical TXA alone [6].

Although TXA can be administered orally, intravenously or topically, the most appropriate route of administration and dose, as well as its efficacy and safety, are still a matter of controversy. Several meta-analyses have shown the efficacy of topical and intravenous TXA in reducing blood loss and RBCT requirements in several clinical settings [7] In a recent open label randomized trial regarding total hip arthroplasty the authors demonstrated that local tranexamic acid reduced blood loss and transfusion in the postoperative period. Furthermore, no thromboembolic complications were observed [8]. Patient Blood Management (PBM) is a holistic approach to the management of blood as a resource for each, single patient; it is a multimodal strategy that is implemented using a set of techniques that can be applied in individual cases [9]. The concept of PBM can be achieved optimizing the patient's erythropoiesis, minimizing bleeding and exploiting individual physiological reserve to tolerate anemia.

Therefore, the combination of topical and intravenous tranexamic acid would contribute to the patient blood management program for major elective orthopedic surgery in adults reducing blood loss and blood transfusion.

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