

Intra-arterial (IA) delivery of chemotherapeutic agents for brain tumors was introduced as a therapeutic option as far back as 1950 by Klopp et al in animals ¹⁾ and 1952 by French et al in humans ²⁾. The initial concept, which remains true today, is that chemotherapy for primary and metastatic brain tumors is limited by the BBB, and IA delivery can increase drug levels in brain tissue, tumor, and cerebrospinal fluid, with decreased systemic toxicity because it eliminates the first-pass effect of the liver, allowing direct high concentration delivery to the tumor. At that time, nitrosourea were considered the preferred agent for IA treatment of GBM because of its lipophilic nature and ability to penetrate the BBB and BTB. Since these very early attempts, IA therapy for brain tumors can be categorized into two eras—the pre-microcatheter era and the modern microcatheter era.

Intra-arterial (IA) delivery has been successful in treating several cancers, but has had limited success in the treatment of GBM, and therefore, has not evolved into a widely used delivery strategy for gliomas. However, with the development of modern microcatheters and the evolution of new endovascular selective intra-arterial (ESIA) approaches to treat cerebrovascular disease, IA delivery, and more specifically ESIA infusion, has emerged as a potential delivery strategy for the treatment of brain tumors. Owing to problems with ineffective intravenous (IV) delivery of new targeted biologic therapies, there is an increased urgency and need to develop ESIA approaches in brain tumor therapy.

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Klopp CT, Alford TC, Bateman J, et al. Fractionated intra-arterial cancer. chemotherapy with methyl bis amine hydrochloride; a preliminary report. Ann Surg 1950;132:811–32.

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French JD, West PM, von Amerongen FK, et al. Effects of intracarotid administration of nitrogen mustard on normal brain and brain tumors. J Neurosurg 1952;9:378–89.

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