

Venous Thromboembolism in Newly Diagnosed Glioblastoma

Question:

Summarize the findings of the article: Incidence of Venous Thromboembolism in Newly Diagnosed Glioblastoma and Associated Risk Factors: A Retrospective Chart Review.

ChatGPT's reply:

Here's a summary of the key findings from *"Incidence of Venous Thromboembolism in Newly Diagnosed Glioblastoma and Associated Risk Factors: A Retrospective Chart Review"*:

Study design & population

- Single-centre retrospective cohort at Juravinski Cancer Centre, Hamilton, Canada [MDPI+1](#)
 - Time span: patients diagnosed from 1 January 2013 to 31 December 2020 [PubMed+1](#)
 - Total included: **528** adult patients with newly diagnosed glioblastoma (GB) (IDH1/2 mutated excluded) [MDPI+2PubMed+2](#)
 - Data collected included: demographics, tumour characteristics, comorbidities, lab values, performance status, treatments, and occurrence of VTE [MDPI+2preprints.org+2](#)
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Incidence of VTE

- **111 of 528 patients (21 %)** developed a venous thromboembolism (VTE) during follow-up [PubMed+2MDPI+2](#)
- Timing:
 - **87 %** of VTE events occurred within 12 months of diagnosis [PubMed+1](#)
 - **62 %** within first 6 months [MDPI+1](#)
- Cumulative incidence (accounting for competing risk of death):
 - 6 months: ~ 13.5 % (CI 10.7–16.6 %) [MDPI](#)
 - 12 months: ~ 18.8 % (CI 15.5–22.4) [MDPI](#)

- 24 months: ~ 23.2 % (CI 19.5–27.1) [MDPI](#)
- Location breakdown:
 - Lower extremity DVT unilateral: 39 patients (35 %) [MDPI+1](#)
 - Upper extremity unilateral: 8 (7 %) [MDPI](#)
 - Bilateral lower extremity: 8 (7 %) [MDPI](#)
 - Pulmonary embolism (PE): 30 (27 %) [MDPI](#)
 - Combined DVT + PE: 25 (23 %) [MDPI](#)
 - Catheter-related: < 4 % [MDPI+1](#)
- Bleeding while on anticoagulation:
 - Intracerebral hemorrhage: ~ 8.3 % [MDPI+1](#)
 - Other bleeding: ~ 9.5 % [MDPI+1](#)

Risk factors for VTE (prognostic predictors)

In univariable and multivariable competing risks regression:

- **Statistically significant predictors:**
 - History of prior cancer (hazard ratio [HR] ~ 1.33, p = 0.045) [MDPI+2preprints.org+2](#)
 - Recurrence / disease progression (HR ~ 1.61, p = 0.013) [MDPI+2PubMed+2](#)
- Variables that approached but did not reach significance:
 - Baseline weakness (paresis) (HR ~ 0.72, p = 0.080) [MDPI+1](#)
 - Platelet count ≥ 350 vs < 350 (HR ~ 0.35, p = 0.079) [MDPI+1](#)
- In stepwise multivariable selection, once recurrence/progression was included, no other factor retained independent statistical significance [MDPI+2preprints.org+2](#)

Thus, aside from prior cancer and disease progression, no strong baseline clinical predictor was reliably identified in this cohort.

Interpretation & implications / limitations

- The study confirms that newly diagnosed glioblastoma patients are at **substantial risk for VTE**, especially within the first year and particularly in the first 6 months. [MDPI+2PubMed+2](#)

- Because only prior cancer and recurrence/progression were significant risk predictors, it is difficult to define a precise “high risk” subgroup at the time of diagnosis based on standard clinical parameters.
- The risk of bleeding (including intracerebral hemorrhage) is nontrivial when using anticoagulation in this population, complicating decisions about VTE prophylaxis. [MDPI+2preprints.org+2](#)
- The authors suggest that **prophylactic anticoagulation** may be considered particularly in the first 6 months post-diagnosis, but emphasize that any preventive strategy must balance thrombotic risk versus bleeding risk. [preprints.org+2MDPI+2](#)
- They note the limitation of their retrospective design, potential underdetection of asymptomatic VTE, and the modest number of events (111) limiting statistical power for multivariable modeling. [MDPI+1](#)
- They call for prospective randomized trials to better delineate which glioblastoma patients might benefit from targeted VTE prophylaxis safely. [preprints.org+2MDPI+2](#)

If you like, I can also highlight how this study compares with prior literature, or assess the strength of its methods. Would you like me to do that?

Yes

Great — here’s a concise comparison to the existing literature and a methodological critique, plus practical takeaways and suggestions for future work.

How this study’s findings compare with prior literature

- **Incidence.** The study’s **21%** VTE incidence (111/528) is at the higher end of reported estimates but falls within the range reported by prior work: pooled/ meta-analytic estimates for high-grade glioma/glioblastoma are roughly **13–16%** (some series report up to 20–30%). This study therefore confirms that GBM is a **high-VTE-risk** population, especially in the first year. [PubMed+2PLOS+2](#)
- **Timing.** The concentration of events in the first 6–12 months after diagnosis (62% within 6 months; 87% within 12 months) matches other reports that show early elevated risk after diagnosis/surgery and during initial treatment. [PubMed+1](#)
- **Risk factors.** This paper found only **prior cancer** and **recurrence/disease progression** to be independent predictors. That’s somewhat narrower than some prior series that have implicated immobility, prior VTE, older age, steroid use, subtotal resection, certain blood markers (high leukocyte or factor VIII, platelet abnormalities), and tumour molecular features (e.g., podoplanin expression, IDH status) as associated with VTE risk. The difference likely reflects cohort/sample size and available variables. [brainlife.org+1](#)

- **Bleeding / anticoagulation safety.** The reported nontrivial intracranial hemorrhage (ICH) and other bleeding rates while anticoagulated are consistent with literature that stresses a real bleeding risk in brain-tumour patients — but more recent reports suggest **DOACs** may have comparable or possibly lower ICH rates than LMWH in selected cohorts. Clinical guidance therefore emphasizes individualized decisions. [ScienceDirect+1](#)

Strengths of this study

- **Large single-center cohort** (n=528) for a glioblastoma VTE study — gives reasonably precise incidence estimates. [PubMed](#)
- **Competing-risk analysis** (accounting for death) for cumulative incidence — appropriate given high mortality in GBM. [PubMed](#)

Limitations (why some differences with prior work may exist)

- **Retrospective, single-center design** → selection bias and variable documentation. [PubMed](#)
- **Detection bias / under-capture of asymptomatic VTE.** Most centers only image when symptomatic, so true incidence could be under- or variably estimated compared with series that used routine screening. [PLOS](#)
- **Limited covariates / event counts for multivariable modeling.** Even 111 events can be modest when testing many predictors — increases chance of type II error (missing true predictors). [PubMed](#)
- **Heterogeneity of anticoagulation practice** (agents, timing, duration) and lack of randomized prophylaxis data — makes safety conclusions cautious and observational. [Annals of Oncology](#)
- **Potential lack of molecular/biomarker data.** Emerging biomarkers (podoplanin, tissue-factor expression, IDH1 status) have been linked to thrombosis risk in other studies but may not be fully captured here. That limits precision in identifying at-diagnosis “high-risk” subgroups. [brainlife.org+1](#)

Practical implications

- Clinicians should be **vigilant for VTE in GBM patients**, especially in months 0–12 after diagnosis. Prophylaxis decisions must balance thrombotic risk against intracranial bleeding risk. [PubMed+1](#)
- Current guideline recommendations emphasize individualized therapeutic-duration decisions (e.g., 3–6 months for treated VTE in brain-tumour patients) and careful multidisciplinary discussion for prophylactic anticoagulation. [Annals of Oncology](#)
- Growing evidence on **DOACs** suggests they are an option to consider, but evidence specific to primary brain tumors remains observational and patient-specific.

Suggested next steps / research priorities

1. **Prospective randomized trials** of prophylactic anticoagulation in newly diagnosed GBM (stratified by bleeding risk) to determine net clinical benefit. [PLOS](#)
 2. **Integration of molecular biomarkers** (podoplanin, tissue factor, IDH status) and laboratory markers (factor VIII, leukocyte counts, platelets) into predictive models to identify high-risk individuals at diagnosis. [brainlife.org+1](#)
 3. **Comparative safety studies of DOACs vs LMWH** specifically in GBM for both VTE prevention and treatment, ideally randomized or large prospective registries.
theoncologist.onlinelibrary.wiley.com
 4. **Standardized surveillance protocols** (or at least clear symptom-triggered imaging pathways) in prospective cohorts to reduce detection bias.
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If you want, I can:

- Pull together a short one-page figure/table that compares incidence and major risk factors across 4–6 key studies (including this one).
- Draft a paragraph critiquing the statistics/multivariable model in more technical detail.
Which would you prefer?

Question:

What is DOAC?

ChatGPT's reply:

A **DOAC** is a **Direct Oral Anticoagulant** — a type of blood thinner (anticoagulant) that directly inhibits specific clotting factors in the blood to prevent or treat blood clots.

There are two main classes:

- **Direct factor Xa inhibitors** (e.g., apixaban, rivaroxaban, edoxaban, betrixaban)
- **Direct thrombin (factor IIa) inhibitor** (dabigatran)

Why they matter

- **Advantages over older drugs:** Unlike warfarin, DOACs don't usually need routine INR monitoring, have fewer food/drug interactions, and have more predictable effects.

- **Clinical use:** Prevention and treatment of **venous thromboembolism (VTE)**, prevention of stroke in **atrial fibrillation**, and other clot-related conditions.
- **In glioblastoma and other brain-tumour patients:** They're increasingly studied as alternatives to low molecular weight heparin (LMWH), but the risk of **intracranial bleeding** is a key concern.

👉 Would you like me to make a short comparison chart of **DOACs vs LMWH vs warfarin** (focusing on VTE in cancer/brain tumors)?

Yes

Here's a clear comparison chart for **DOACs vs LMWH vs Warfarin**, with focus on VTE in cancer and brain tumor patients (like glioblastoma):

Anticoagulant Options in VTE (esp. Cancer / Brain Tumors)

Feature	DOACs (Apixaban, Rivaroxaban, Edoxaban, Dabigatran)	LMWH (Enoxaparin, Dalteparin, Tinzaparin)	Warfarin
Mechanism	Direct inhibition of clotting factors (Xa or IIa)	Indirect inhibition of factor Xa & IIa (via antithrombin)	Vitamin K antagonist (reduces synthesis of clotting factors II, VII, IX, X)
Route	Oral (pills)	Subcutaneous injection (daily or bid)	Oral (pills)
Monitoring	Usually none needed (predictable pharmacology)	None routinely (except in renal impairment or extremes of weight)	Requires INR monitoring (variable metabolism, many interactions)
Interactions	Some drug interactions (CYP3A4, P-gp substrates) but fewer than warfarin	Minimal drug interactions	Many food (vitamin K) and drug interactions
Onset/Offset	Rapid onset & offset (hours)	Rapid onset (hours)	Slow onset (days); requires bridging with LMWH initially
Reversal	Specific antidotes exist (andexanet alfa for Xa inhibitors, idarucizumab for dabigatran)	Protamine only partially effective	Vitamin K, PCC (prothrombin complex concentrate)
Evidence in Cancer VTE	Increasing evidence (Hokusai VTE Cancer, SELECT-D, Caravaggio trials) — effective and often safer than warfarin; comparable to LMWH, possibly lower recurrence	Historically standard of care in cancer (CLOT trial); still guideline-endorsed, especially in high bleeding risk	Less favored; higher recurrence and bleeding risk in cancer patients
Brain Tumor Context (e.g., GBM)	Emerging data: effective for VTE treatment, but intracranial hemorrhage risk is a concern ; some studies suggest risk is not higher than LMWH, but evidence remains limited	Long-time standard in GBM patients with VTE; still widely used when bleeding risk is high or DOAC not appropriate	Generally avoided due to unpredictable INR, high bleeding risk, and drug/diet variability

Feature	DOACs (Apixaban, Rivaroxaban, Edoxaban, Dabigatran)	LMWH (Enoxaparin, Dalteparin, Tinzaparin)	Warfarin
Convenience	High (oral, no injections, no labs)	Moderate/low (requires injections, costly)	Low (labs, diet restrictions, drug interactions)

✓ Bottom line for GBM patients:

- **LMWH** has been the “go-to” historically because of safety concerns about brain bleeding.
- **DOACs** are becoming more attractive due to oral dosing and growing evidence suggesting similar safety — but many clinicians still use LMWH first in GBM until more prospective data are available.
- **Warfarin** is largely avoided in cancer-associated thrombosis, especially brain tumors.

Would you like me to also add **guideline recommendations (e.g., ASCO, NCCN, EANO)** on anticoagulant choice in glioblastoma patients with VTE? That could round out the comparison.

Yes

Here are what several major oncology/thrombosis guideline panels currently recommend regarding anticoagulant choice (DOACs, LMWH, etc.) in cancer-associated VTE, with special attention to brain-tumor (glioma / glioblastoma) patients. The evidence is still limited in some respects, but there is growing consensus.

Guideline Recommendations

Guideline / Panel	Key Points for Cancer-Associated VTE in Brain-Tumor / Glioblastoma Patients
ASCO (American Society of Clinical Oncology)	<ul style="list-style-type: none"> - Anticoagulation <i>should</i> be offered when VTE is established in patients with primary brain tumors. PMC+2ASC Publications+2 - The choice of agent (DOAC vs LMWH vs others) remains somewhat uncertain because safety data in brain-tumor patients are limited. PMC+1 - In cancer patients generally (not only brain tumors), DOACs (e.g. apixaban, rivaroxaban) are now acceptable options for treatment of VTE (including long-term) in many patients, especially where bleeding risk isn't high. ASC Publications - Recognizes brain tumors are high risk for VTE and that withholding anticoagulation imposes risk of recurrent VTE. education.nccn.org
NCCN (National Comprehensive Cancer Network)	<ul style="list-style-type: none"> - States that DOACs should be considered for treatment of VTE in patients with brain tumors. LMWH remains a mainstay, especially when bleeding risk is high. education.nccn.org - For brain metastases, DOACs and LMWH appear to have similar risk of intracerebral hemorrhage; data in glioma (primary brain tumor) are more limited. education.nccn.org
International Clinical Practice / ISTH / Other	<ul style="list-style-type: none"> - For patients undergoing neurosurgery: LMWH or unfractionated heparin (UFH) postoperatively is recommended. jthjournal.org+1

Guideline / Panel	Key Points for Cancer-Associated VTE in Brain-Tumor / Glioblastoma Patients
Cancer-Thrombosis Guidelines	<ul style="list-style-type: none"> - For outpatients with brain tumors not having had neurosurgery, primary pharmacological prophylaxis (i.e. giving anticoagulants to prevent VTE in absence of thrombosis) is generally <i>not</i> recommended. MDPI+1 - For established VTE, anticoagulation with LMWH or DOACs is recommended, where bleeding risk permits. MDPI+2PubMed+2 - Duration: typically anticoagulation for 3-6 months minimum, then reassess based on cancer activity & individual risk/benefit. jthjournal.org+1

Specific Caveats & Special Considerations

- **Bleeding risk** is especially important in glioblastoma / malignant glioma. Intracranial hemorrhage risk is higher, so guidelines emphasize patient-by-patient evaluation. [jthjournal.org+2portailvasculaire.fr+2](#)
- **Choice of anticoagulant agent:** DOACs are increasingly accepted in guidelines for cancer-associated VTE, but in brain tumour populations data are more sparse; LMWH remains the more established option in many cases. [PubMed+1](#)
- **Postoperative prophylaxis:** LMWH or UFH are recommended after neurosurgery, once bleeding risk is acceptable. [jthjournal.org+1](#)
- **Outpatient prophylaxis (primary prevention)** in brain tumour patients (without VTE) is *not* generally recommended because of uncertain benefit vs risk. [MDPI+2jthjournal.org+2](#)

If you like, I can pull up the **European (e.g. EANO, ESMO)** guideline positions too — might be useful for comparison given you're in Milan.

Yes

Good — here's a concise, sourced summary of the **European guideline/consensus positions (EANO / ESMO / joint statements)** on anticoagulation for VTE in patients with primary brain tumours (including glioblastoma), and the practical caveats clinicians emphasise.

Key guideline recommendations (short)

- **Treat confirmed VTE promptly.** Once VTE is diagnosed in a patient with a brain tumour, anticoagulation should generally be started unless there is a clear contraindication. [PubMed+1](#)
- **Agent choices — LMWH or DOACs are acceptable in many cases.** Historically LMWH was preferred in cancer, but guidelines now accept DOACs (e.g., apixaban, rivaroxaban, edoxaban) as alternatives for cancer-associated VTE when bleeding risk is not high and drug interactions/renal function permit. However, evidence specifically in primary brain tumours (gliomas) is still limited, so many recommendations remain cautious. [esmo.org+1](#)

- **Duration — usually ≥ 6 months then reassess.** For cancer-associated VTE, a minimum of 6 months of therapeutic anticoagulation is recommended, with continuation beyond that individualized to cancer activity and bleeding risk. Guidelines apply this principle to brain-tumour patients as well. [PMC+1](#)
- **Perioperative/prophylactic use after neurosurgery.** Early postoperative prophylactic anticoagulation (typically LMWH or UFH) is recommended once the immediate surgical bleeding risk is judged acceptable; timing should be individualized in consultation with neurosurgery. Routine primary pharmacological prophylaxis for ambulatory brain-tumour patients (without VTE) is **not** generally recommended because the bleeding vs benefit balance is uncertain. [Nature+1](#)

Important caveats stressed by guidelines

- **Intracranial hemorrhage risk is the central concern.** Because primary brain tumours (especially high-grade gliomas) carry a higher baseline risk of intracerebral bleeding, guidelines repeatedly emphasise individualized risk–benefit assessment rather than blanket use of DOACs or prophylactic anticoagulation. [PubMed+1](#)
- **Evidence gaps for glioma-specific DOAC safety.** While large cancer-VTE trials support DOACs in many cancers, patients with primary brain tumours were often excluded or under-represented; thus recommendations in glioma remain cautious and rely partly on observational data. Prospective trials are still needed. [esmo.org+1](#)
- **Multidisciplinary decision-making is essential.** Guidelines recommend involving oncology, neurosurgery, hematology/ thrombosis specialists (and radiology) to decide timing, agent, and duration, particularly when neurosurgery or active intracranial disease is present. [PubMed+1](#)

Practical summary for clinicians

- If VTE occurs: start therapeutic anticoagulation unless immediate bleeding risk/contraindication exists. Consider LMWH or a DOAC after weighing interactions, renal function, and bleeding risk. [esmo.org+1](#)
- Continue anticoagulation for **at least 6 months**, then reassess. Longer therapy is reasonable while active cancer persists. [PMC](#)
- Avoid routine outpatient (primary) prophylaxis for all glioma patients — select high-risk individuals only after careful evaluation. Use pharmacologic prophylaxis post-neurosurgery when bleeding risk permits. [Esmo Open+1](#)

If you'd like, I can:

- Pull the specific recommendation text and grading from the EANO-ESMO guideline paper (Ann Oncol 2021) and the ESMO VTE guideline (so you have exact phrasing and strength of recommendation).

- Create a one-page clinician checklist (when to start, which agent to prefer, monitoring, when to pause for surgery/biopsy).

Which would you prefer?

Both

Great — below I give (1) the **specific, guideline-level recommendations** from European bodies (EANO–ESMO and ESMO) plus international guidance, with source citations; and (2) a compact **one-page clinician checklist** you can use at the bedside when a glioblastoma / primary brain-tumour patient has (or might have) VTE.

All statements below are drawn from the EANO–ESMO clinical practice guideline (Annals of Oncology 2021), the ESMO cancer-VTE guidance, and international thrombosis guidance/consensus documents. I've cited the most important sources after each block.

1) Key guideline recommendations (specific phrasing / intent, with citations)

- **Treat confirmed VTE in brain-tumour patients unless a clear contraindication exists.**
EANO–ESMO states that therapeutic anticoagulation should be offered when VTE is diagnosed in patients with primary brain tumours, recognizing the high baseline bleeding risk and the need for individualized assessment. [Annals of Oncology+1](#)
- **Both LMWH and DOACs are acceptable options for treatment of cancer-associated VTE, but exercise caution in primary brain tumours.**
ESMO (and EANO–ESMO) note that randomized cancer-VTE trials support DOACs as alternatives to LMWH in many cancers, and guidelines now accept DOACs for cancer-associated VTE generally — however, patients with primary brain tumours were under-represented in trials, so recommendations for glioma patients remain cautious and should be individualized. [esmo.org+1](#)
- **Peri-neurosurgical timing and postoperative prophylaxis:**
After neurosurgery, pharmacologic thromboprophylaxis (typically LMWH or UFH) may be started once the immediate bleeding risk is acceptable, with timing individualized in conjunction with the neurosurgical team. Routine outpatient primary prophylaxis (giving anticoagulants to all ambulatory brain-tumour patients) is generally **not** recommended. [ScienceDirect+1](#)
- **Duration of anticoagulation:**
For cancer-associated VTE including brain-tumour patients, guidelines recommend a minimum of **3–6 months** of therapeutic anticoagulation and usually **≥ 6 months** while cancer is active — then reassess continuation vs stopping based on tumour status and bleeding risk. EANO–ESMO specifically recommends reassessing at ~6 months. [Annals of Oncology+1](#)
- **Multidisciplinary decision-making emphasised.**
Because of competing risks (VTE vs intracranial hemorrhage), guidelines recommend decisions

about anticoagulant choice, timing around procedures, and duration be made jointly by oncology, neurosurgery, and thrombosis/hematology teams. [PMC+1](#)

2) One-page clinician checklist — “VTE in glioblastoma / primary brain-tumour” (practical steps)

Use this as a quick reference at point of care.

1. Confirm the diagnosis

- Imaging: compression ultrasound for suspected DVT; CT pulmonary angiography for suspected PE.
- If diagnosis uncertain, discuss imaging urgency with radiology.

2. Immediate assessment (within hours)

- Neurological status & recent neurosurgery/biopsy (date of last neurosurgical procedure).
- Active intracranial hemorrhage on recent imaging? → **If yes**, involve neurosurgery/hematology; anticoagulation may be withheld/modified.
- Platelets, hemoglobin, creatinine, liver tests, coagulation profile.
- Current medications (particularly strong CYP3A4 or P-glycoprotein inhibitors/inducers) that interact with DOACs.

3. Decision to start anticoagulation

- **If no absolute contraindication** (no active ICH, acceptable platelet count, neurosurgical team agrees): **start therapeutic anticoagulation**.
- **If recent major intracranial bleed or very high bleeding risk**: consider temporary withholding, IVC filter only in exceptional/short-term situations, and frequent re-assessment by multidisciplinary team.

4. Choice of agent

- **LMWH** (e.g., enoxaparin, dalteparin, tinzaparin): established choice in cancer patients and frequently used when bleeding risk high or when drug-interaction/absorption/renal issues make DOACs less suitable.
- **DOACs** (apixaban, rivaroxaban, edoxaban, dabigatran): acceptable alternative in many cancer patients; consider in glioma patients **only after individualized assessment** (tumour status, surgical timing, drug interactions, renal function).

- Avoid or use caution with DOACs in severe renal impairment, strong interacting drugs, or where oral absorption may be unreliable.

- **Warfarin**: generally not preferred in cancer-associated VTE.

5. Monitoring & safety

- Baseline labs: CBC (platelets), renal function, hepatic function.
- Periodic CBC & renal function checks while on therapy (frequency individualized; e.g., at 2 weeks, 1 month, then periodically).
- Educate patient/family on signs of intracranial hemorrhage (new severe headache, focal neurologic deficits, altered mental status) and bleeding elsewhere.

6. Perioperative / procedural planning

- For planned neurosurgery/biopsy: stop therapeutic anticoagulation with appropriate timing per agent (discuss with neurosurgery and anesthesia); restart postoperatively when hemostasis acceptable (often 24–72+ hours depending on bleeding risk and procedure).
- Prophylactic LMWH/UFH post-op: start when surgical bleeding risk acceptable per neurosurgery.

7. Duration & follow-up

- Treat for **at least 3–6 months**; often continue **≥ 6 months** while cancer is active.
- At ~6 months reassess: ongoing active cancer, place of therapy, bleeding events, patient preference → continue vs stop.
- If recurrent VTE on anticoagulation → re-evaluate adherence, drug interactions, consider switching agent or dose escalation with hematology consultation.

8. When to consult specialists

- Any recent intracranial hemorrhage, neurosurgery within prior 2–4 weeks, thrombocytopenia (platelets $<50 \times 10^9/L$), recurrent VTE on treatment, or complex drug-interaction scenarios → **consult neurosurgery + hematology/thrombosis** immediately.

Sources (most important / load-bearing)

- EANO–ESMO Clinical Practice Guideline, *Neurological and vascular complications of primary and secondary brain tumours* (Annals of Oncology 2021). [Annals of Oncology+1](#)
- ESMO Clinical Practice Guideline — *Venous thromboembolism in cancer patients* (ESMO guideline pages / guidance). [esmo.org](#)

- 2022 International clinical practice guideline for the management of cancer-associated thrombosis (Farge et al. / ISTH-endorsed summaries & reviews). [PMC](#)
 - ASH / other thrombosis guidance and cancer-VTE reviews summarizing duration and agent selection in cancer patients. [Ash Publications+1](#)
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If you want, I can now:

- Pull **the exact recommendation text and grading** (word-for-word short excerpts with the grade letters/numbers shown) from the EANO–ESMO PDF and the ESMO guideline page and paste them here (I'll keep quotes under 25 words each), **or**
- Turn the one-page checklist into a printable PDF or a one-slide PowerPoint you can save/print.

Which next step would you like?

Both

I did a search, but I could not reliably find *exact, word-for-word recommendation texts with strength grades* specific to **glioblastoma / primary brain tumour VTE anticoagulation** beyond what's already known in the general brain tumour / cancer-VTE context. The EANO–ESMO and ESMO guidelines include some statements and grading in the broader setting of neurological/vascular complications and cancer-associated VTE. Below is what I found, plus commentary about the gaps.

Then I attach the one-page checklist I gave earlier, in a cleaner printable format.

Extracted guideline statements & grading (from EANO/ESMO, ESMO cancer VTE guidelines)

From EANO–ESMO: Neurological & vascular complications of brain tumours (Annals of Oncology guideline)

- “The duration of therapeutic anticoagulation for treatment of VTE **should be 6 months for brain tumour patients who are in complete remission** and should be extended beyond 6 months while the tumour is active.” [Annals of Oncology+2ResearchGate+2](#)
- The guideline provides recommendations with levels of evidence / grades (for vascular complications) in various sections. [ResearchGate+1](#)
- The same guideline is titled “*Neurological and vascular complications of primary and secondary brain tumours: EANO-ESMO Clinical Practice Guidelines for prophylaxis, diagnosis, treatment and follow-up*”. [ResearchGate+1](#)

However, I did **not** find a clear statement such as “In patients with glioblastoma, DOAC is recommended grade X” within the guideline text from the resources I could access.

From ESMO: Venous Thromboembolism in Cancer Patients (CPG)

- The ESMO guideline, updated and published as a PDF, states that “**LMWH or DOACs are effective treatments**” for cancer-associated VTE. [portailvasculaire.fr+2esmo.org+2](#)
- The ESMO guideline recommends **therapeutic anticoagulation (parenteral agents) for 3 to 6 months** in patients with cancer-associated VTE. [Esmo Open](#)
- ESMO also states that **routine thromboprophylaxis is not recommended in ambulatory cancer patients** (i.e., not universal prophylaxis) but may be considered in selected high-risk patients. [Esmo Open+2portailvasculaire.fr+2](#)
- In the summary I found, ESMO recommends use of LMWH or UFH for pharmacologic prophylaxis in cancer patients undergoing major surgery (unless contraindicated), with a strength “I, A” grading cited in a summary block. [magazine.ictic.com](#)

Gaps & limitations in what I found

- None of the statements I located are **specific to glioblastoma** (i.e. “in glioblastoma patients, use DOAC with grade X”) — most are broader cancer or brain tumour vascular complication guidelines.
- The EANO–ESMO guideline does give a specific **6-month duration recommendation** for brain tumour patients in remission, which is the most specific statement I found. [Annals of Oncology+1](#)
- I did *not* find accessible full texts that show all recommendation grades (A, B, C, etc.) for each anticoagulant choice in glioma patients. It is likely such detail exists in full guideline documents (behind paywalls or requiring access) but not in the open excerpts I could retrieve.

If you like, I can try to access the full guideline PDFs (e.g. via institutional access) and extract the precise graded statements and send them to you (if I succeed).

Compact printable version of the one-page checklist

Here’s a clean, printable checklist you can copy into Word / PDF:

Checklist: VTE Management in Glioblastoma / Primary Brain Tumour Patients

1. Diagnosis confirmation

- Perform appropriate imaging (e.g. Doppler US for DVT, CT pulmonary angiogram for PE).

2. Baseline risk assessment

- Neurologic status, recent neurosurgery/biopsy.
- Evidence of intracranial hemorrhage on recent imaging.
- Labs: platelets, hemoglobin, creatinine, liver function.
- Review medications (esp. potential drug interactions with DOACs).

3. Decision to anticoagulate

- If no contraindications (e.g. active ICH, very recent surgery), initiate therapeutic anticoagulation.
- If high bleeding risk or contraindication, delay, monitor, or consider alternatives (e.g. IVC filter only in exceptional cases).

4. Choice of anticoagulant

- **LMWH**: preferred in high bleeding-risk or complex cases.
- **DOACs**: acceptable alternative if patient's risk profile, renal function, interactions, and tumour status allow.
- **Warfarin**: generally avoided in this setting.

5. Monitoring & safety surveillance

- At baseline and periodically: CBC, renal & hepatic function.
- Educate re: symptoms of intracranial hemorrhage (headache, focal deficits, altered mental status) and bleeding signs.

6. Procedural / surgical planning

- Stop anticoagulation per agent-specific half-life before planned neurosurgery/biopsy.
- Restart postoperatively when hemostasis is adequate (often 24–72+ hours).
- Use prophylactic LMWH/UFH post-op when safe.

7. Duration & reassessment

- Continue **at least 3–6 months**, and **6 months** especially in remission brain tumour patients.
- After 6 months: re-evaluate tumour activity, bleeding history, patient preference → decide continuation vs stop.

8. Complex scenarios / referrals

- Recurrent VTE despite anticoagulation.
- Concurrent intracranial hemorrhage.
- Recent neurosurgical intervention.
- Thrombocytopenia, renal failure, or drug-interaction complexity.
- In such cases, consult **neurosurgery, hematology / thrombosis specialists**.

If you like, I can try to send you the full guideline PDF versions (if available) or the parts detailing anticoagulation in glioblastoma specifically (if they exist). Would you like me to do that?

No. It's all for now.

Perfect — glad I could gather what you needed. If later you'd like the full guidelines or a polished PDF/slide of the checklist, just let me know. Good luck with your work!