

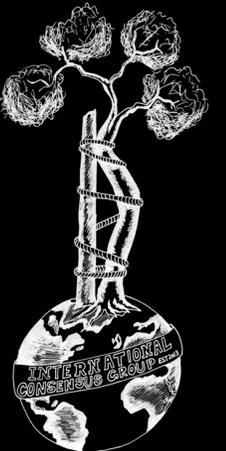
ICM VTE Spine

1 – Is routine screening for DVT required in the pre-operative and/or post-operative period for patients undergoing spine procedures?

- **Response/Recommendation:** There is no role for routine screening for deep venous thrombosis (DVT) in patients undergoing spine procedures. Doppler ultrasonography surveillance may be considered in high-risk surgical patients including those who are older, with spine injury, personal history of VTE, malignancy, cervical spondylotic myelopathy (CSM), and/or non-ambulatory.

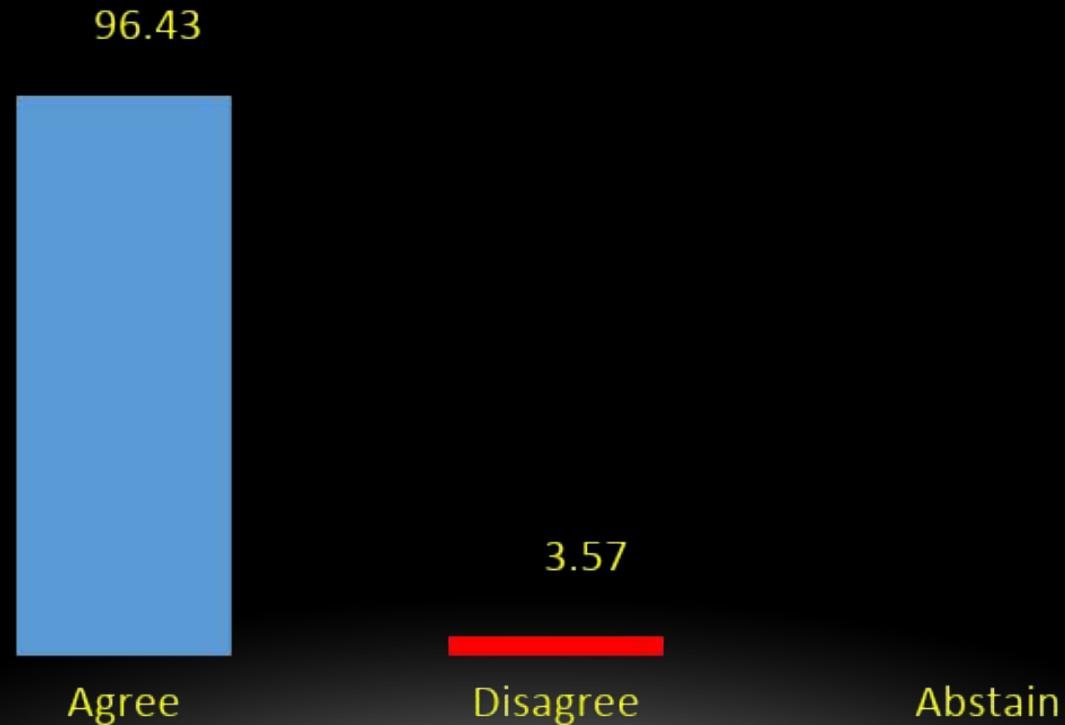
Strength of Recommendation: Limited.

Andrea Angelini, Gentaro Kumagai, Olivier Q. Groot

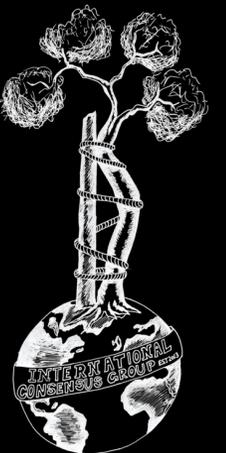


ICM VTE Spine

1 - Are certain patients identified to be at greater risk for venous thromboembolism than others?



(Strong Consensus)



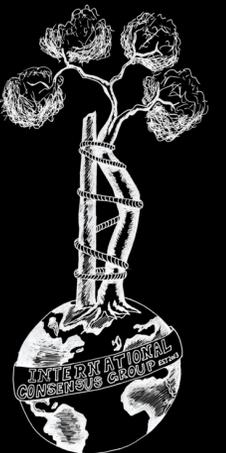
ICM VTE Spine

2 – Concerning VTE risk, which surgeries can be considered high-risk, and which surgeries can be considered low-risk in spine surgery?

- **Response/Recommendation:** Concerning venous thromboembolism (VTE) risk in spine surgery, high-risk procedures include those performed for oncologic, traumatic, or infection, as well as those requiring intensive care unit (ICU) admission, multiple stages, or combined approaches. Lumbar procedures including long-segment fusions or procedures utilizing an anterior approach, as well as posterior cervical fusions, should also be considered high-risk. On the other hand, most elective pediatric procedures, microdiscectomies, anterior cervical fusions, and lumbar or cervical decompressions may be considered low risk procedures.

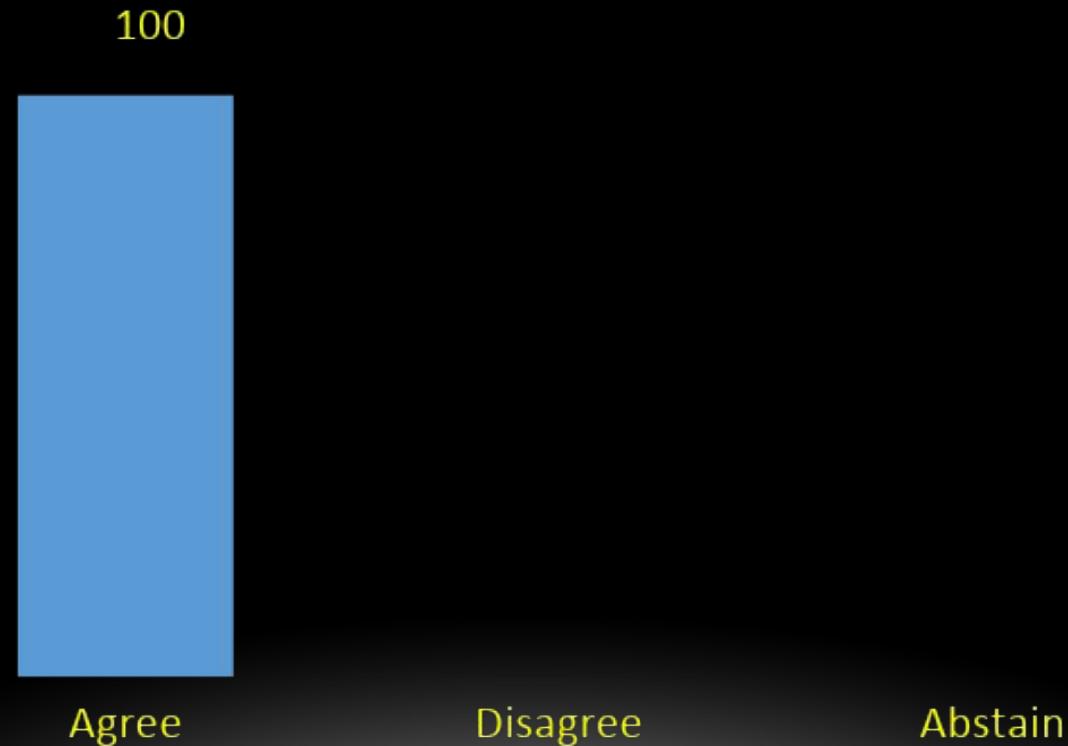
Strength of Recommendation: Moderate.

Jose A. Canseco, Gregory R. Toci, Olivier Q. Groot, Joseph H. Schwab

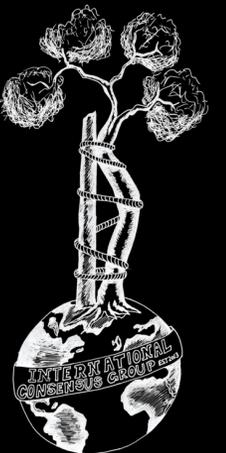


ICM VTE Spine

2 – Concerning VTE risk, which surgeries can be considered high-risk, and which surgeries can be considered low-risk in spine surgery?



(Unanimous Strong Consensus)



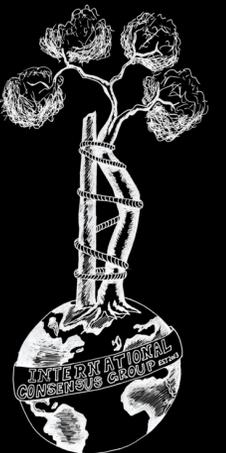
ICM VTE Spine

3 – Does the concern for epidural hematoma influence the choice for VTE prophylaxis after spine surgery?

- **Response/Recommendation:** Epidural hematoma is a feared yet rare postoperative complication after spinal surgery, with symptomatic rates ranging from 0% to 1.8%. Although there is no published evidence to precisely define the safety of chemoprophylaxis, it seems that postoperative anticoagulants in non-therapeutic doses can be administered without an increased risk of spinal epidural hematoma. Prospective studies are required to better balance the risks and benefits of prophylactic anticoagulants regarding spinal epidural hematomas and Venous thromboembolism (VTE).

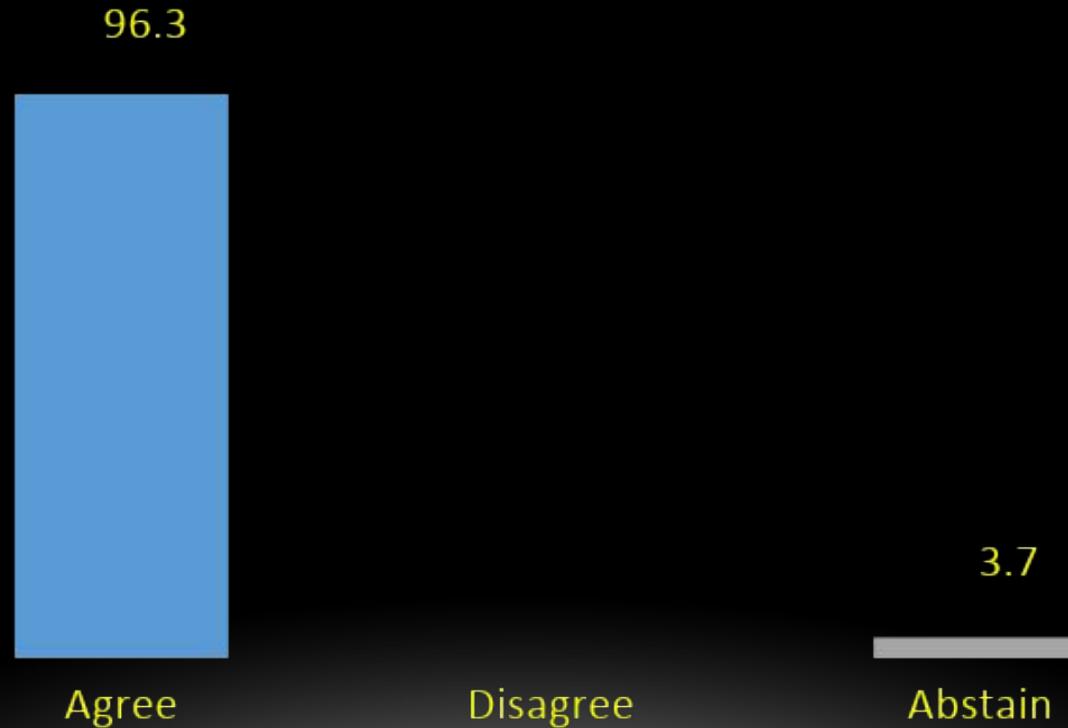
Strength of Recommendation: Limited.

Olivier Q. Groot, David W. Polly Jr., Joseph H. Schwab

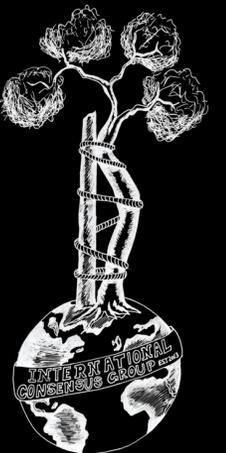


ICM VTE Spine

3 – Does the concern for epidural hematoma influence the choice for VTE prophylaxis after spine surgery?



(Strong Consensus)



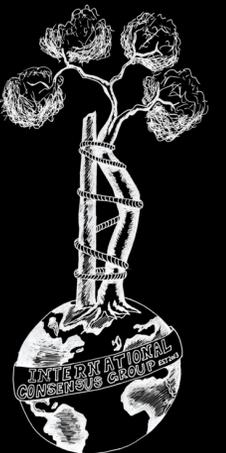
ICM VTE Spine

4 – When can VTE chemoprophylaxis, if to be used, be started following spine procedures?

- **Response/Recommendation:** Venous Thromboembolism (VTE) chemoprophylaxis can probably be started within 24 – 48 hours following elective lumbar fusions, and within 48 hours following patients considered to be higher risk with bleeding. Chemoprophylaxis benefits should be carefully weighed against the risks of bleeding and hematoma formation.

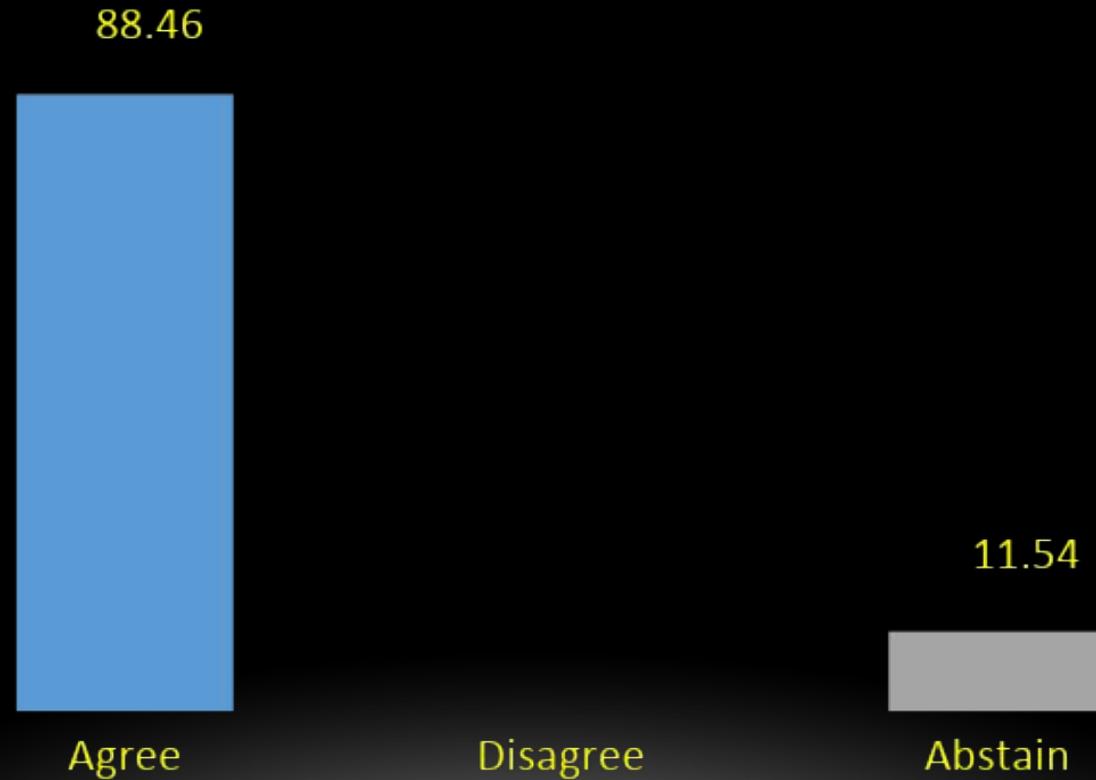
Strength of Recommendation: Limited.

Jonathan N. Grauer, Jeremy L. Fogelson

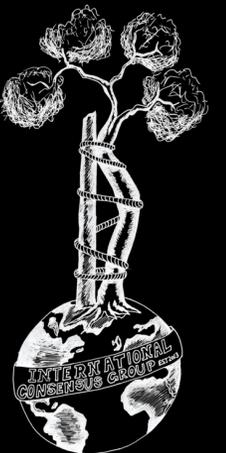


ICM VTE Spine

4 – When can VTE chemoprophylaxis, if to be used, be started following spine procedures?



(Strong Consensus)



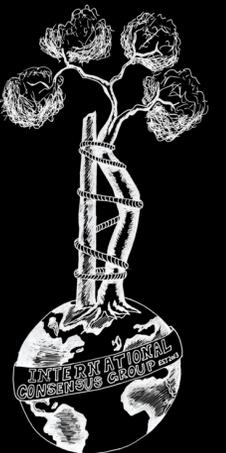
ICM VTE Spine

5 – If VTE prophylaxis is to be administered, does the number of levels, and/or the anatomic location, and/or surgical approach (i.e., minimally invasive) influence the choice of VTE prophylaxis for patients undergoing spinal surgery?

- **Response/Recommendation:** There is some evidence suggesting that chemoprophylaxis should be considered in patients undergoing multi-level lumbar spine surgery, especially when performed through an anterior approach.

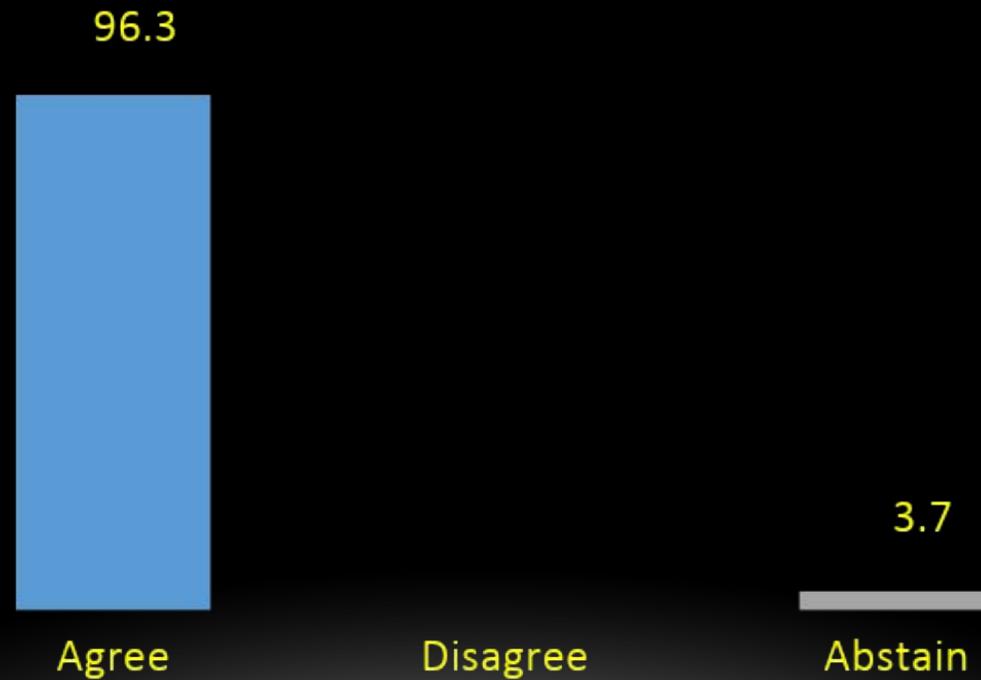
Strength of Recommendation: Limited.

*Jose A. Canseco, Arun P. Kanhere, Ana Castel-Oñate,
Alexander R. Vaccaro*

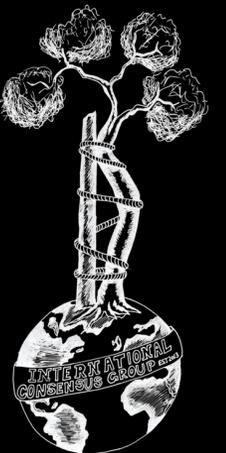


ICM VTE Spine

5 – If VTE prophylaxis is to be administered, does the number of levels, and/or the anatomic location, and/or surgical approach (i.e., minimally invasive) influence the choice of VTE prophylaxis for patients undergoing spinal surgery?



(Strong Consensus)



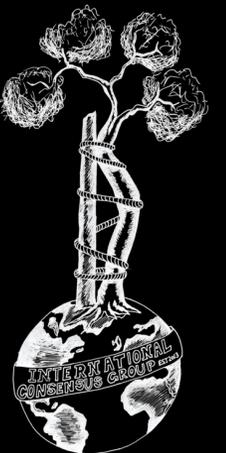
ICM VTE Spine

6 – Is aspirin a viable chemoprophylaxis for VTE in patients undergoing spine surgery?

- **Response/Recommendation:** While aspirin (ASA) may reduce venous thromboembolism (VTE) after orthopaedic procedures, there are no high-quality studies addressing this issue in patients undergoing spine surgery. We recommend surgeons weigh the potential benefits of chemoprophylaxis with known risks of increased bleeding.

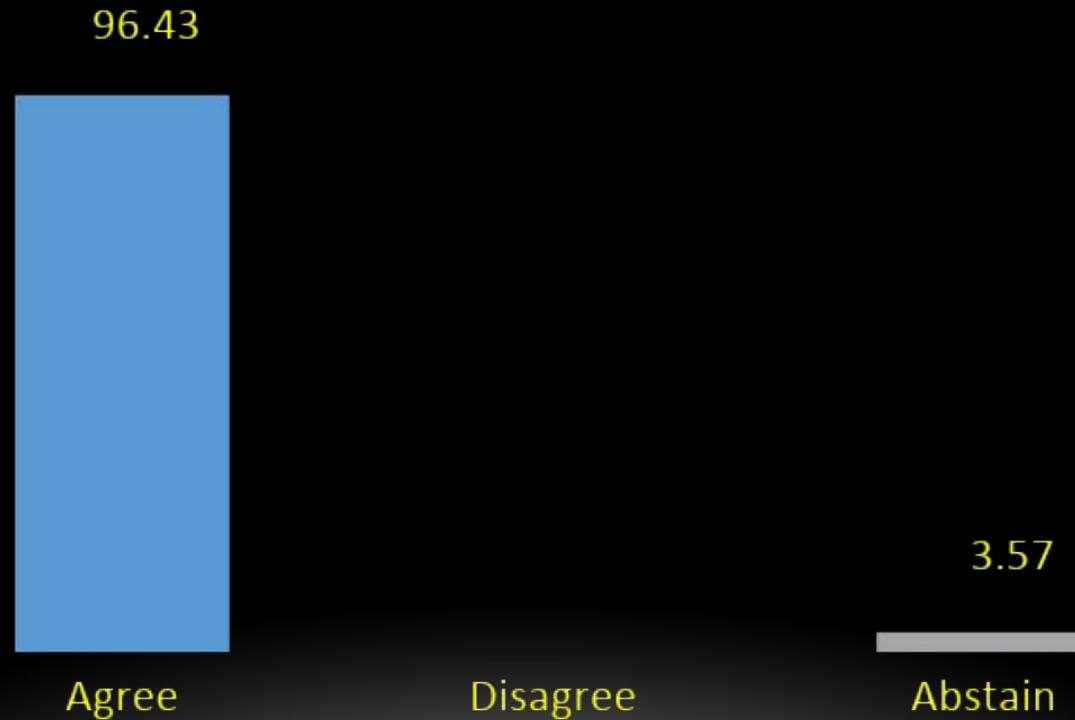
Strength of Recommendation: Consensus.

*Nicholas M. Siegel, Mark Lambrechts, Chadi Tannoury,
Alexander R. Vaccaro*

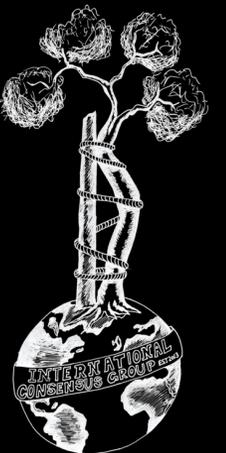


ICM VTE Spine

6 – Is aspirin a viable chemoprophylaxis for VTE in patients undergoing spine surgery?



(Strong Consensus)



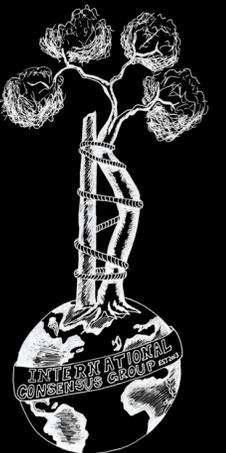
ICM VTE Spine

7 – What is the optimal protocol for management of patients who are on aspirin for a non-spine related disorder prior to spine surgery?

- **Response/Recommendation:** Prior to spine surgery, low dose-aspirin (LD-ASA) (81 mg - 500 mg) used for primary and secondary cardiovascular prevention, can be stopped for one to three days. For ASA doses > 1 g per day, ASA should be stopped for at least seven days prior to surgery. However, in patients with extensive cardiac history, it is reasonable to maintain LDASA (81 mg) throughout spine surgery.

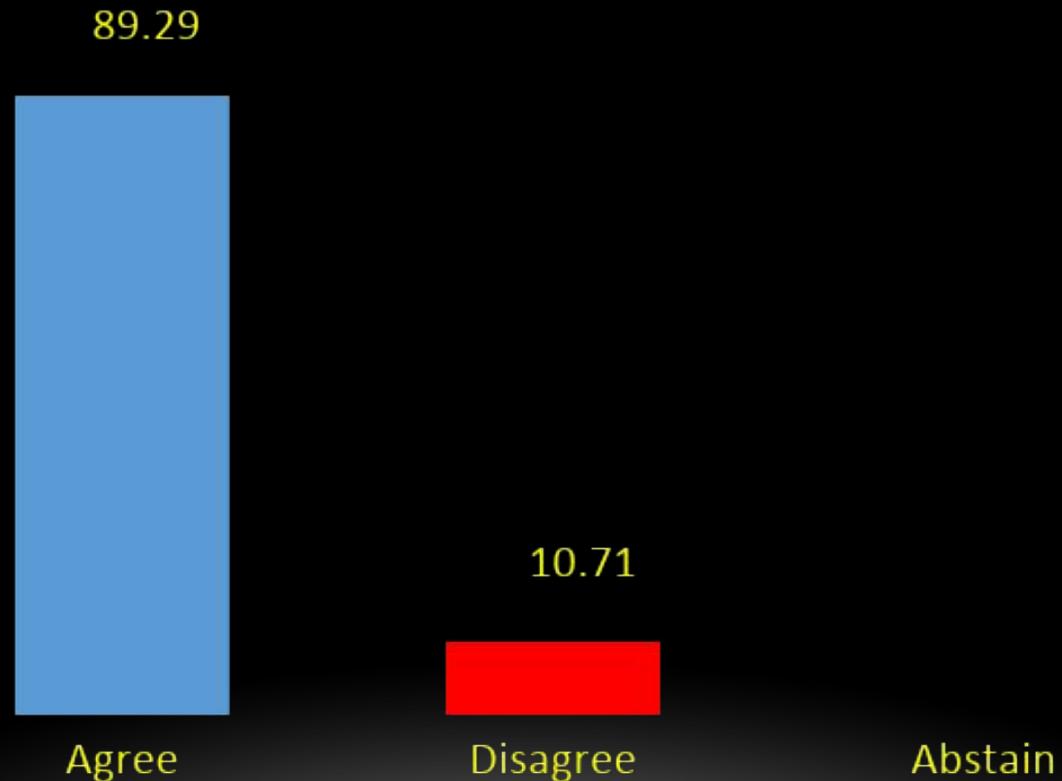
Strength of Recommendation: Moderate.

Chadi Tannoury, Ryan M. Sutton

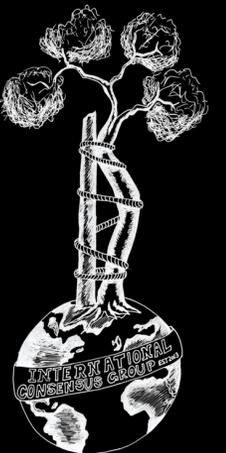


ICM VTE Spine

7 – What is the optimal protocol for management of patients who are on aspirin for a non-spine related disorder prior to spine surgery?



(Strong Consensus)



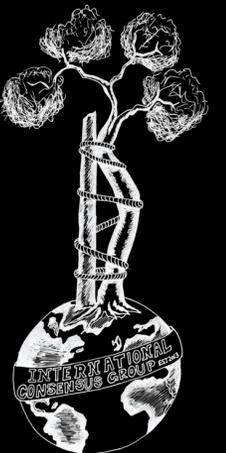
ICM VTE Spine

8 – What is the optimal protocol for management of patients who are being treated with warfarin for a non-spine related disorder prior to spine surgery?

- **Response/Recommendation:** Warfarin (Coumadin) should be discontinued at least 5 days before spine surgery, and the international normalized ratio (INR) goal should be 1.2 or less.

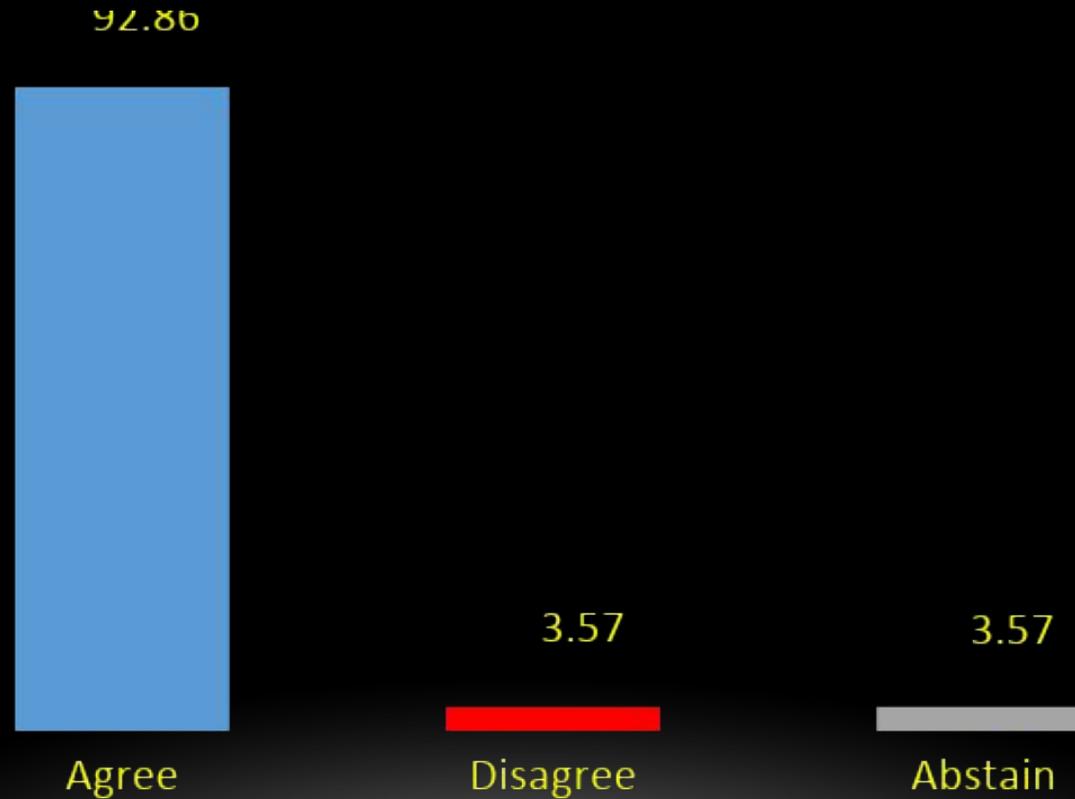
Strength of Recommendation: Moderate.

Chadi Tannoury, Ryan M. Sutton

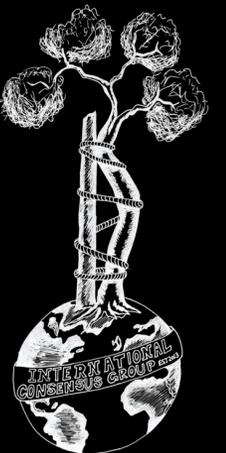


ICM VTE Spine

8 – What is the optimal protocol for management of patients who are on aspirin for a non-spine related disorder prior to spine surgery?



(Strong Consensus)



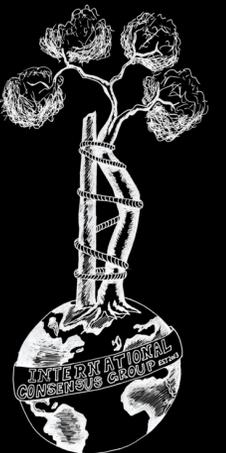
ICM VTE Spine

9 – In patients on anticoagulants for a non-spine disorder, is perioperative bridging therapy necessary following cessation of anticoagulation prior to spine surgery?

- **Response/Recommendation:** Perioperative bridging anticoagulation therapy is not superior to placebo in preventing thromboembolic events following cessation of anticoagulation prior to spine surgery. Additionally, bridging anticoagulation therapy can be associated with higher risk of major bleeding. If a bridging therapy is contemplated in high-risk patients, and at the discretion of the treating physician, unfractionated heparin and low-molecular-weight heparin (LMWH) are reasonable options.

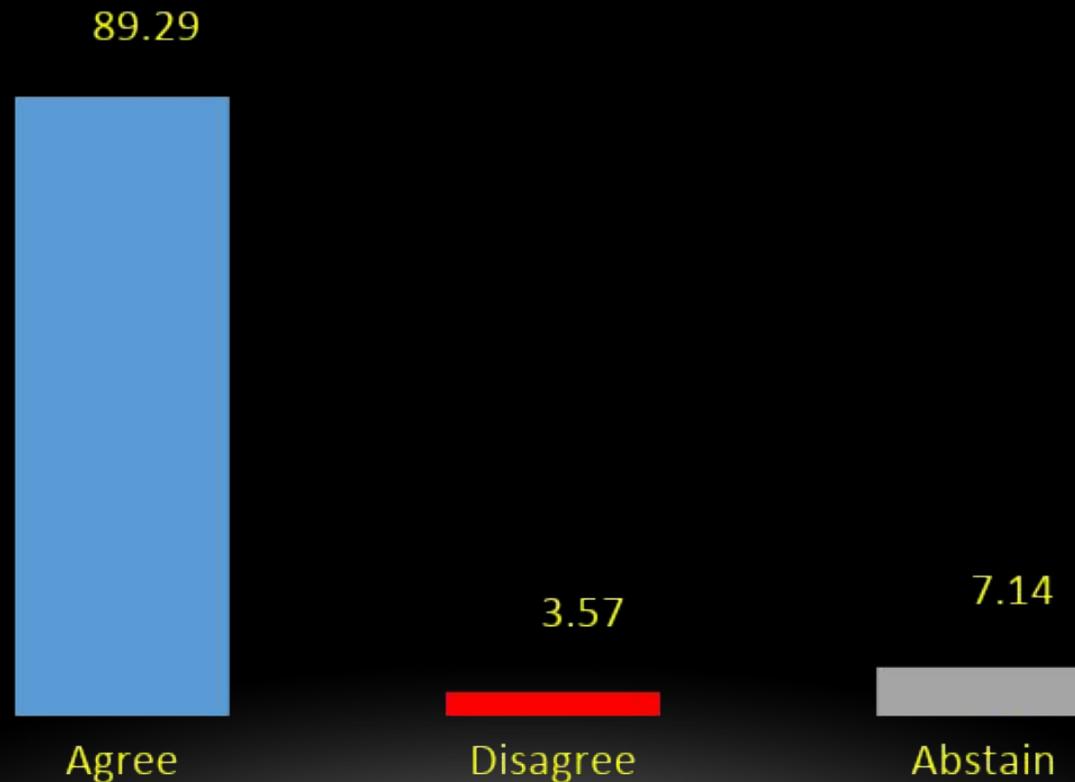
Strength of Recommendation: Limited.

Chadi Tannoury, Ryan M. Sutton

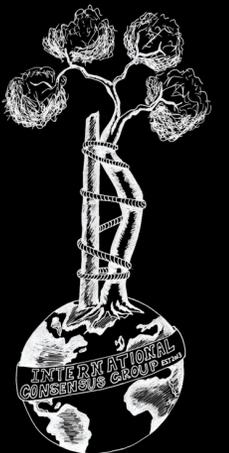


ICM VTE Spine

9 – In patients on anticoagulants for a non-spine disorder, is perioperative bridging therapy necessary following cessation of anticoagulation prior to spine surgery?



(Strong Consensus)



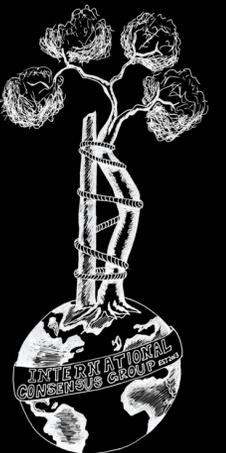
ICM VTE Spine

10 – Do patients with spine trauma require routine VTE prophylaxis before and after surgery?

- **Response/Recommendation:** Patients suffering from traumatic spine injury are at an increased risk for venous thromboembolism (VTE). Recommendations for VTE prophylaxis before and after surgery in spine trauma varies based on pertinent factors such as presence of spinal cord injury (SCI), segment of the spine involved and age.

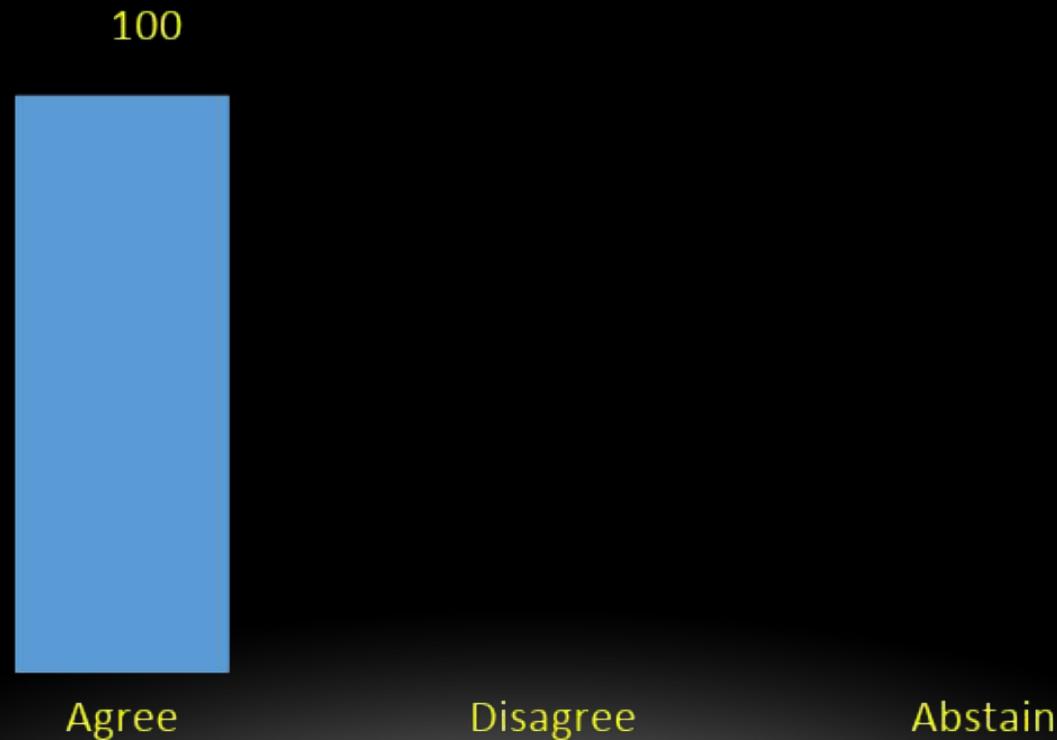
Strength of Recommendation: Moderate.

Adwin Denasty, Addisu Mesfin

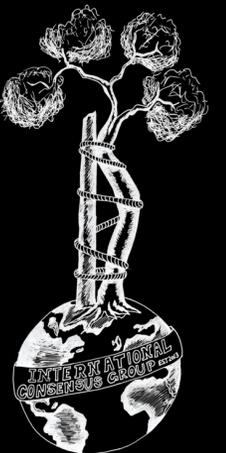


ICM VTE Spine

10 – Do patients with spine trauma require routine VTE prophylaxis before and after surgery?



(Unanimous Strong Consensus)



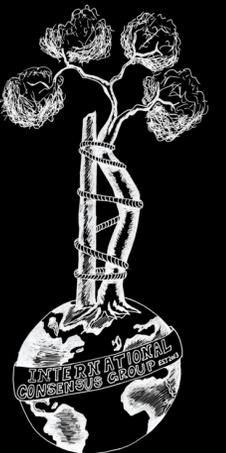
ICM VTE Spine

11 – Does the presence of a dural tear influence the choice for VTE prophylaxis after spine surgery?

- **Response/Recommendation:** Following spine surgery, the rate of venous thromboembolism (VTE) is significantly higher in patients with incidental durotomy (almost 1.5 times) compared to patients without. Therefore, in patients with dural tears post spine surgery, vigorous VTE prophylaxis therapies should be considered.

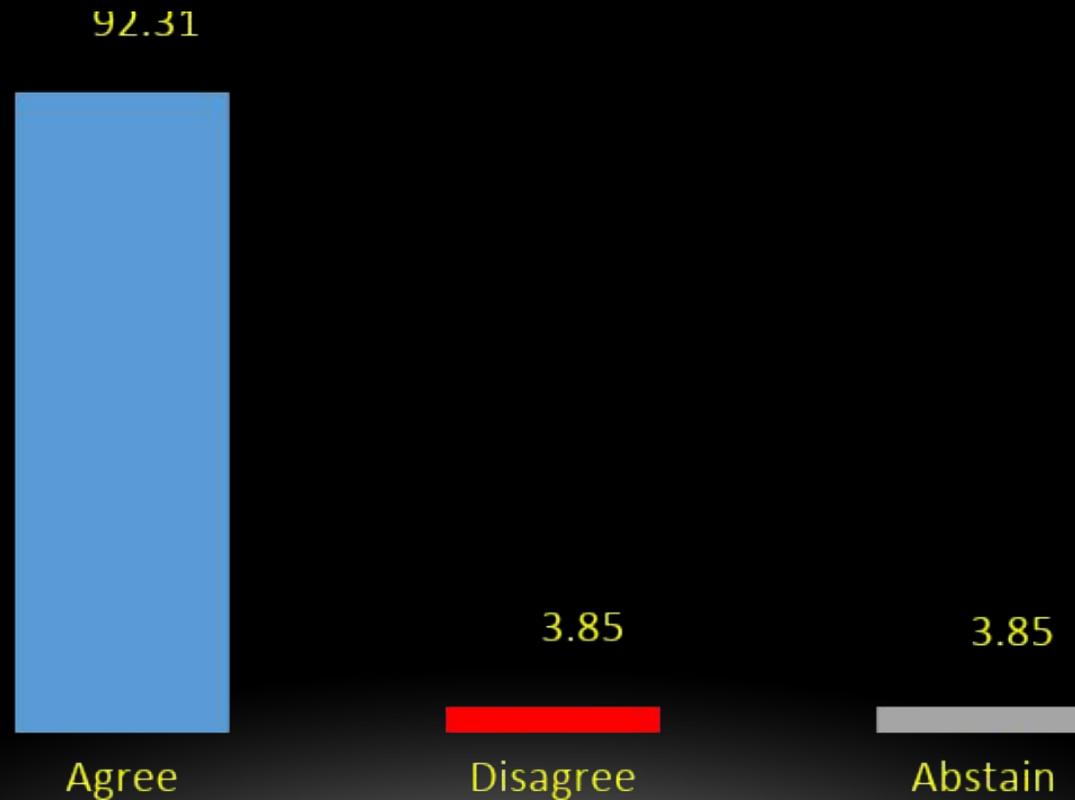
Strength of Recommendation: Limited.

*Brian A. Karamian, Tony Tannoury, Khoa S. Tran,
Alexander R. Vaccaro*

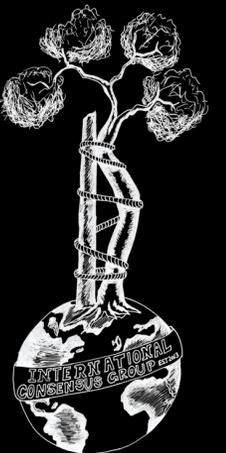


ICM VTE Spine

11 – Does the presence of a dural tear influence the choice for VTE prophylaxis after spine surgery?



(Strong Consensus)



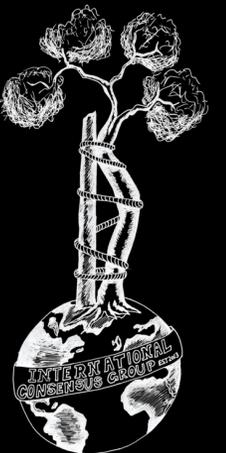
ICM VTE Spine

12 – Should pediatric patients undergoing major spine procedures require routine VTE prophylaxis?

- **Response/Recommendation:** Routine administration of pharmacologic venous thromboembolism (VTE) prophylaxis for major spinal procedures in pediatric patients is not supported by current evidence. Chemoprophylaxis should be limited to patients with multiple risk factors. Controversy exists on the utility of mechanical prophylaxis, although it poses minimal risk.

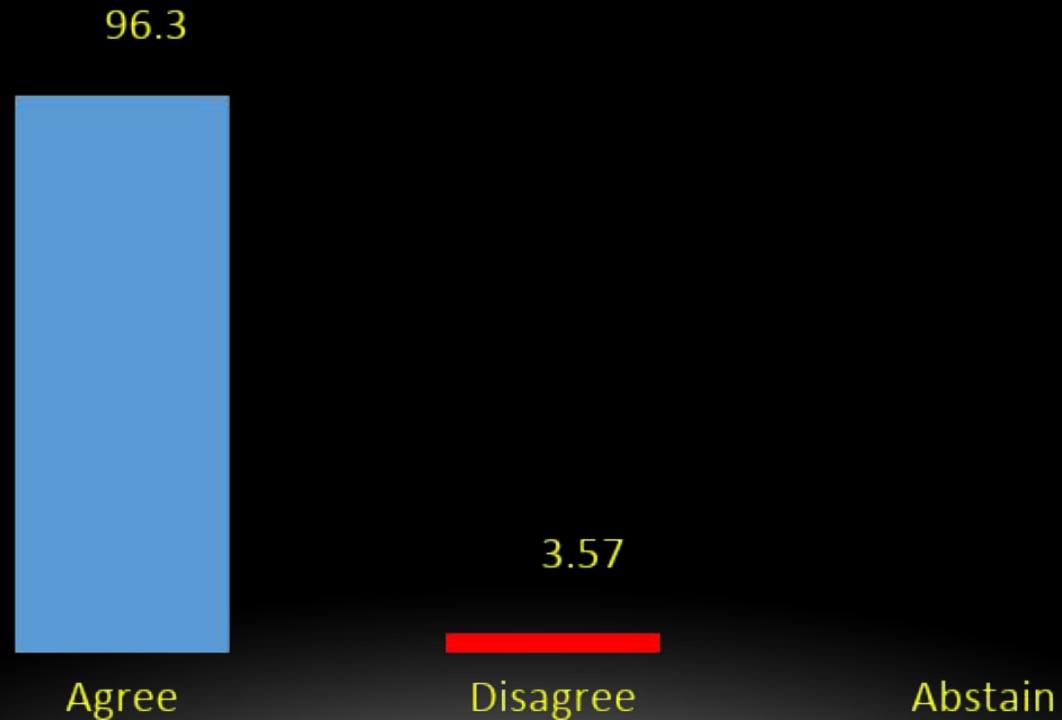
Strength of Recommendation: Limited.

Harold A. Fogel, Ali Parsa, Stephen DiMaria



ICM VTE Spine

12 – Should pediatric patients undergoing major spine procedures require routine VTE prophylaxis?



(Strong Consensus)

