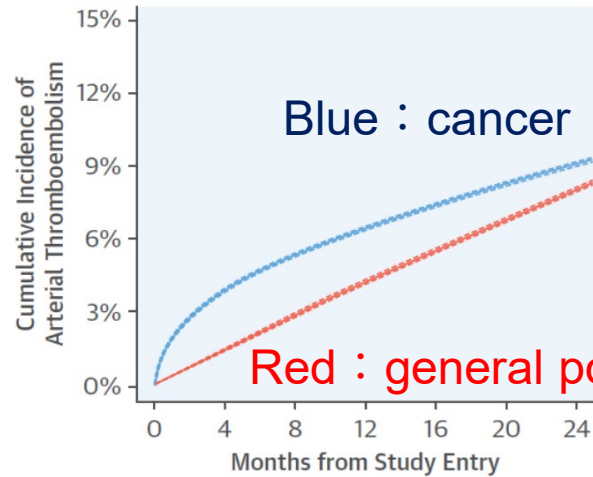# Development of risk assessment tool for ischemic stroke in cancer patients

AHANDS score

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Cancer patients have an increased risk of stroke

Blue：cancer

Red：general population

Navi BB, et al. *J Am Coll Cardiol* 2017

✓ Cancer patients have an elevated risk of stroke.

✓ The pathophysiology of Cancer-Associated Stroke (CAS) remains unknown and the treatment is not established.

✓ CAS has a significantly NEGATIVE impact on the patients' outcomes.

➡There is an UEGENT NEED
to develop preventive measures against CAS

VTE in cancer patients: Khorana score

Khorana score

✓ Khorana score is a risk assessment tool for venous thromboembolism (VTE) in cancer patients.

✓ Patients having 3 or more are considered as high risk for VTE, and those would have anticoagulation medicine to reduce the risk of VTE.

Patient Characteristic	Points
Site of cancer	
Stomach, pancreas (Very high risk)	2
Lung, lymphoma, gynecologic, bladder, testicular, renal (High risk)	1
Platelet count ≥ 350,000/µL prior to chemotherapy	1
Hemoglobin level < 10 g/dL or use of red cell growth factors	1
Prechemotherapy leukocyte count >11,000/µL	1
Body mass index ≥ 35 kg/m2	1
Add points for total score	
High risk	≥3
Intermediate risk	1–2 points
Low risk	0 points

➡Similarly to Khorana score,
a risk assessment tool for CAS would be able to prevent CAS!

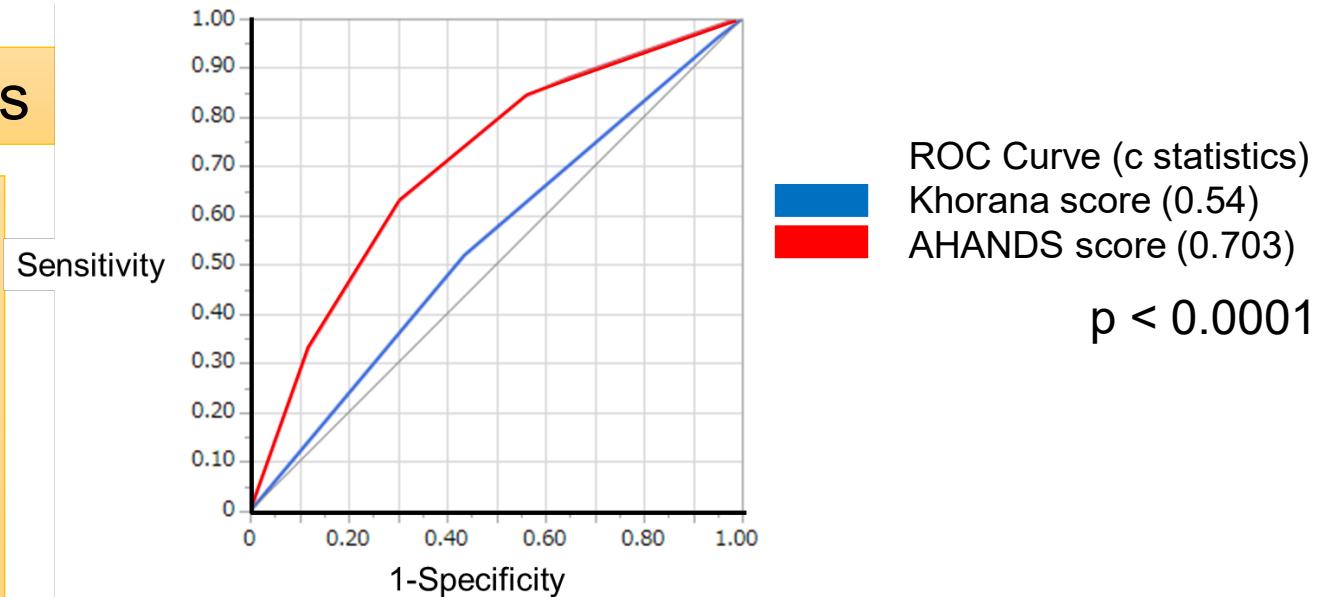大阪大学大学院医学系研究科
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AHANDS score: a risk assessment tool for CAS

✓ We developed AHANDS score, that can assess the risk of ischemic stroke within 2 years from cancer diagnosis using cancer patients registry in the University of Osaka Hospital.

AHANDS score consists of 6 parameters

Age >=75 y
Hypertension
Atrial fibrillation
NLR （neutrophil to lymphocyte ratio）
D-dimer
advanced cancer Stage

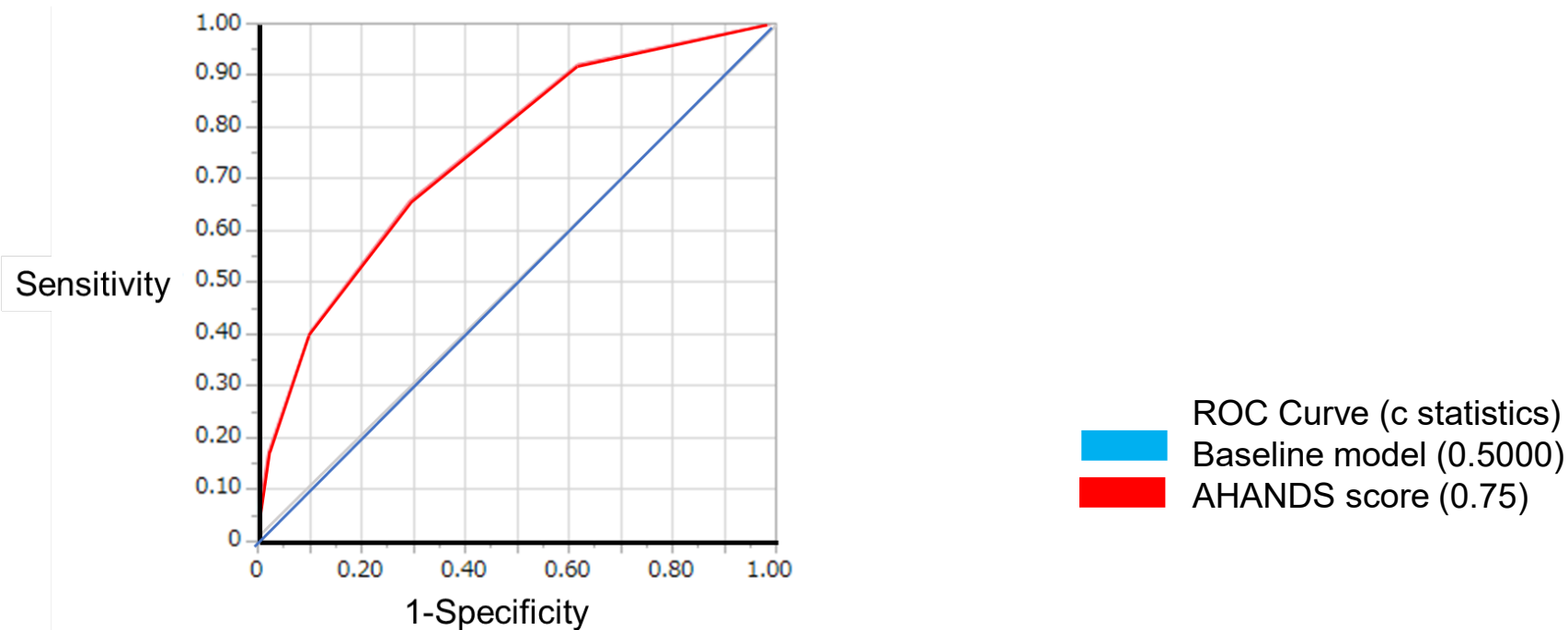1 point for each parameter（Max 6 points）

Sensitivity

1-Specificity

ROC Curve (c statistics)
Khorana score (0.54)
AHANDS score (0.703)

p < 0.0001

AHANDS score have a significantly higher predictive ability.

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Validation

✓ We examined the predictive ability of AHANDS score in different cohort, that is cancer patients registry in Osaka International Cancer Institute.
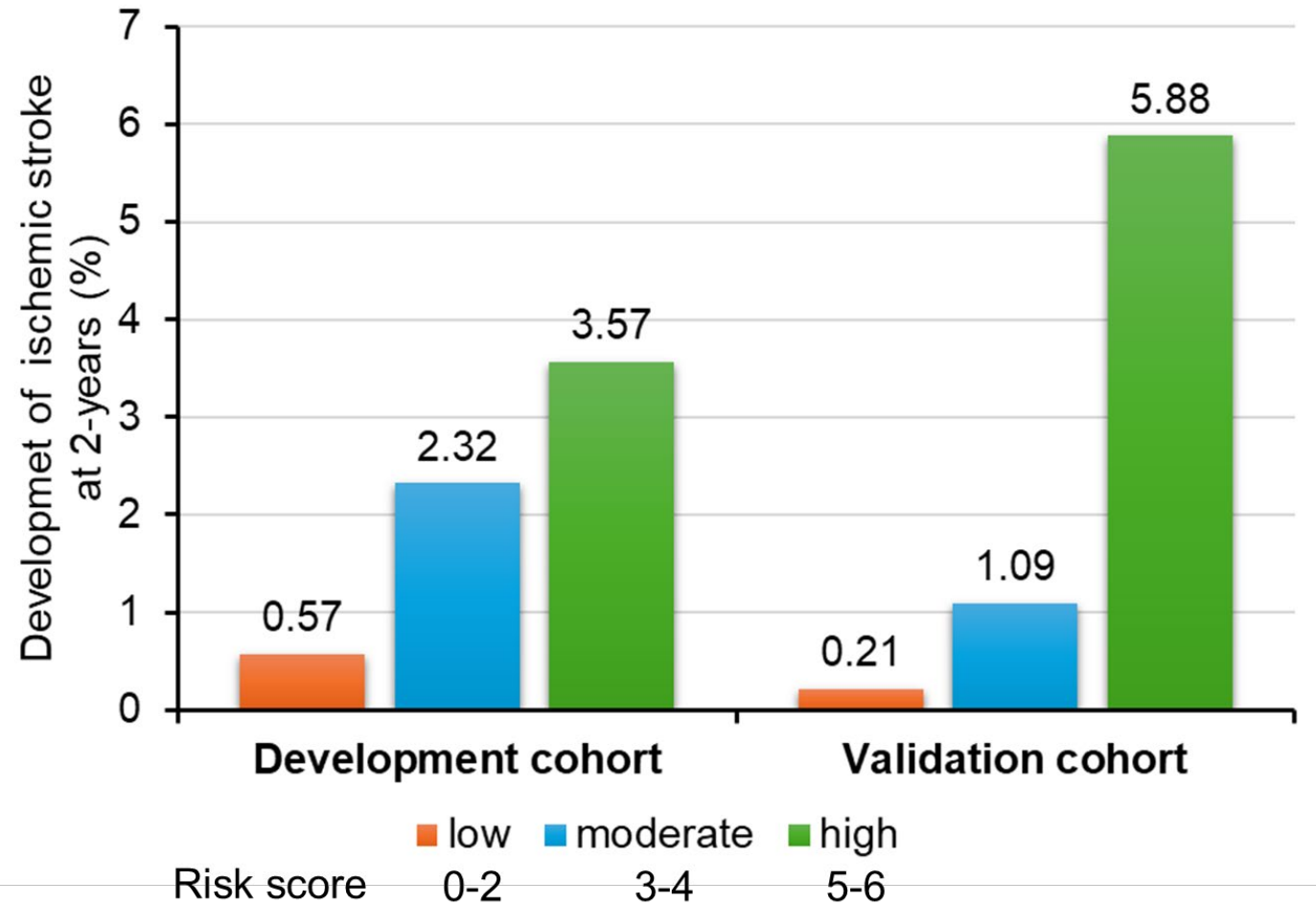

ROC Curve (c statistics)
Baseline model (0.5000)
AHANDS score (0.75)

➡AHANDS score also had a similar predictive ability in the validation cohort.

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5 or more are considered as high risk for CAS

AHANDS score consists of 6 parameters

Age >=75 y
Hypertension
Atrial fibrillation
NLR （neutrophil to lymphocyte ratio）
D-dimer
advanced cancer Stage

1 point for each parameter（Max 6 points）

Future strategy

➢ We FIRST developed a risk assessment tool for CAS in the world.

➢ AHANDS score has a moderate predictive ability (C statics 0.7 or more）and good generality.

➢ AHANDS sore is PATENT pending and we are now IMPROVING AHANDS score

➢ We are also planning to examine if anticoagulation medicine can reduce the risk of CAS in patients with 5 or more in AHANDS score.

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