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# Gestion cardio-vasculaire des patients avant une chirurgie non cardiaque

Recommandations ESC 2022

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Coopération hospitalière  
**Nord Alsace**

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# Introduction

Pourquoi ?

313 millions chirurgie / an => 4,2 millions décès péri-op / an

85% chirurgies non cardiaques

Environ 50% décès cardio-vasculaires

=> diminuer décès cardio-vasculaires et complications cardiaques

Dernières recommandations ESC 2014

# Mortalité post-op = 3e cause de décès !

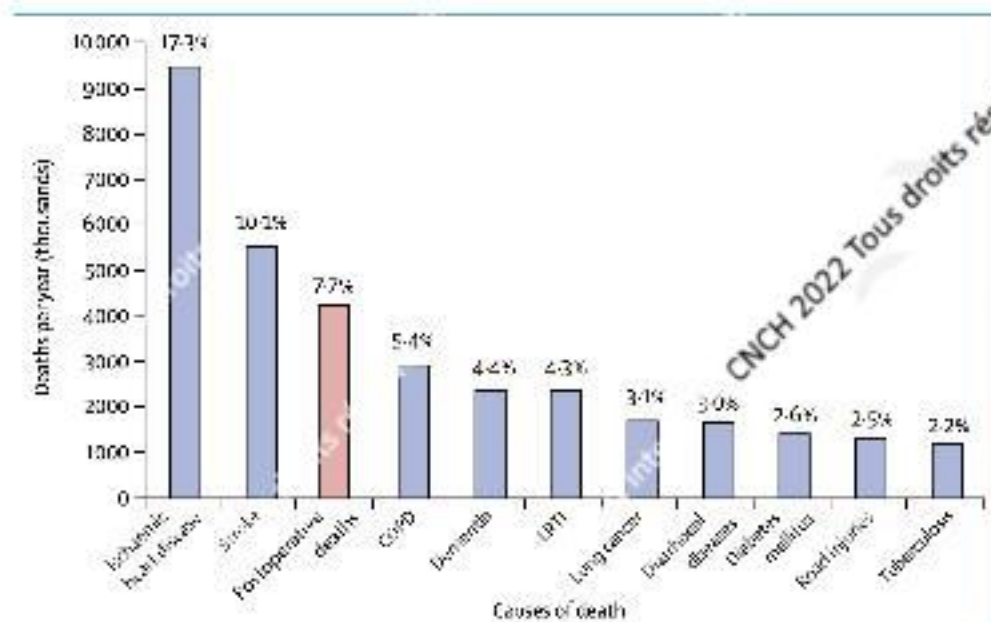
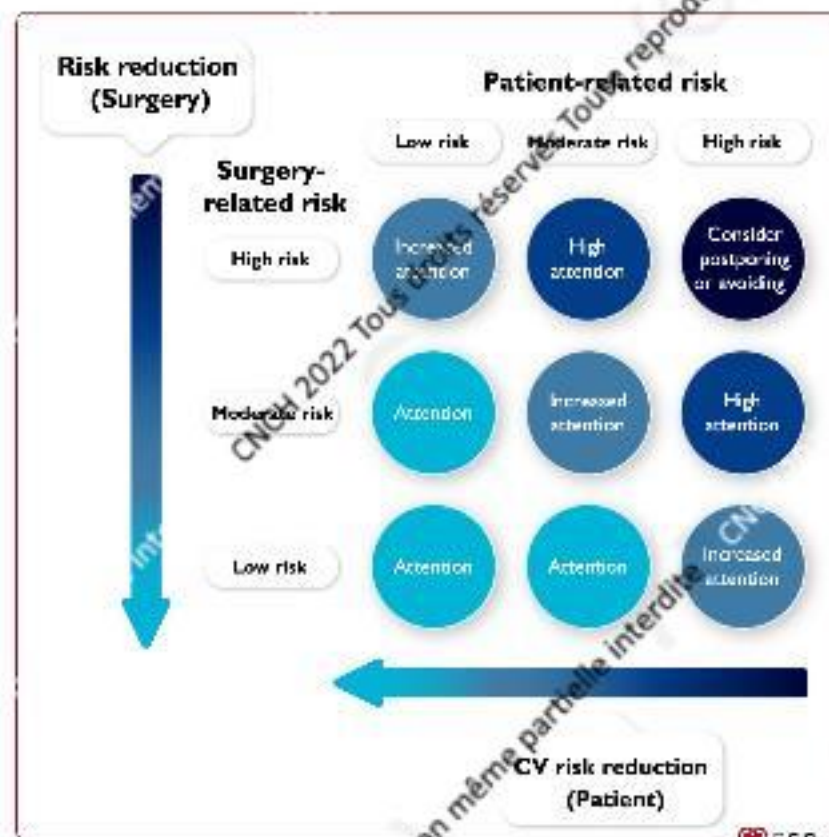


Figure: Top ten global causes of death, 2019

Nepegodiev N, et al. The Lancet 2019

# Evaluation du risque clinique



# Risque lié à la chirurgie

- Type et durée de la chirurgie
- Degré d'urgence (immédiat, urgent, « time-sensitive », électif)
- Risque mortalité cardio-vasculaire, IDM et AVC à 30 jours

**Table 5** Surgical risk estimate according to type of surgery or intervention

Low surgical risk (<1%)	Intermediate surgical risk (1–5%)	High surgical risk (>5%)
<ul style="list-style-type: none"><li>• Breast</li><li>• Dental</li><li>• Endocrine (thyroid)</li><li>• Eye</li><li>• Gynaecological (minor)</li><li>• Orthopaedic (minor) (meniscectomy)</li><li>• Reconstructive</li><li>• Superficial surgery</li><li>• Urological (minor) (transurethral resection of the prostate)</li><li>• VATS (minor) lung resection</li></ul>	<ul style="list-style-type: none"><li>• Carotid artery stenosis (CEA or CAS)</li><li>• Carotid artery stenosis (CEA)</li><li>• Endovascular aortic aneurysm repair</li><li>• Head or neck surgery</li><li>• Intraoperative splenectomy, lysis, hernia repair, choledochostomy</li><li>• Intrathoracic (non-major)</li><li>• Neurological or orthopaedic (major hip and spine surgery)</li><li>• Peripheral arterial angioplasty</li><li>• Renal transplants</li><li>• Urological or gynaecological (major)</li></ul>	<ul style="list-style-type: none"><li>• Adrenal resection</li><li>• Aortic and major vascular surgery</li><li>• Carotid artery stenosis (CAS)</li><li>• Ductless endocrine surgery</li><li>• Liver resection, bile duct surgery</li><li>• Oesophagectomy</li><li>• Open lower limb revascularization for acute limb ischaemia or amputation</li><li>• Pancreatectomy (VATS or open surgery)</li><li>• Plasmotomy or liver transplant</li><li>• Resect of perforated bowel</li><li>• Total gastrectomy</li></ul>

CAA, carotid artery stenosis; CEA, carotid endarterectomy; CAS, carotid stenting; MI, myocardial infarction; VATS, video-assisted thoracoscopic surgery.  
Surgical risk estimate is a broad approximation of 30-day risk of CV death, MI and stroke in risk groups according to the specific surgical intervention, without considering the patient's overall clinical status.

Adapted from data in Gonzalez et al., Mukherjee et al., Sandhu et al., and Woodcock et al.<sup>15,16</sup>

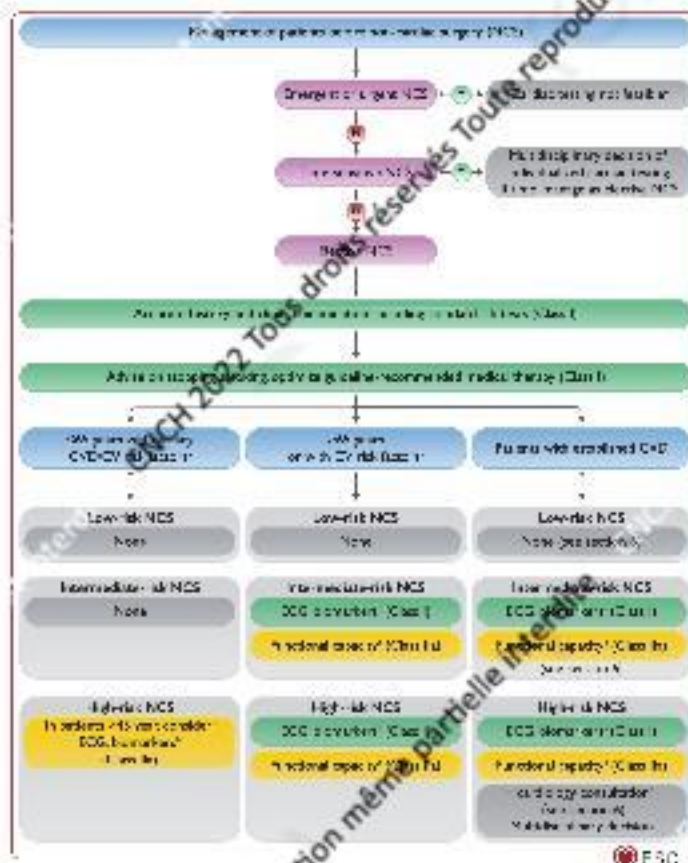
## Risque lié au patient

- < 65 ans ou  $\geq$  65 ans
- FDRCV : tabagisme, HTA, diabète, dyslipidémie, hérédité
- ATCD de maladie cardio-vasculaire
- (Comorbidités)

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# Algorithme décisionnel pour l'évaluation du risque

- Anamnèse
- Examen clinique
- Avant chirurgie risque : Hb + créatinine
- ECG
- Biomarqueurs : BNP, troponine
- Capacité fonctionnelle
- Consultation cardio



intermédiaire ou élevé

NT-proBNP,

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# Biomarqueurs

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
In patients who have known CVD or CV risk factors (including age $\geq 65$ years), or symptoms or signs suggestive of CVD it is recommended to obtain a pre-operative 12-lead ECG before intermediate- and high-risk NCS. <sup>97-99</sup>	I	C
In patients who have known CVD, CV risk factors (including age $\geq 65$ years), or symptoms suggestive of CVD it is recommended to measure hs-cTn T or hs-cTn I before intermediate- and high-risk NCS, and at 24 h and 48 h afterwards. <sup>53,105-107,109-111,117</sup>	I	B

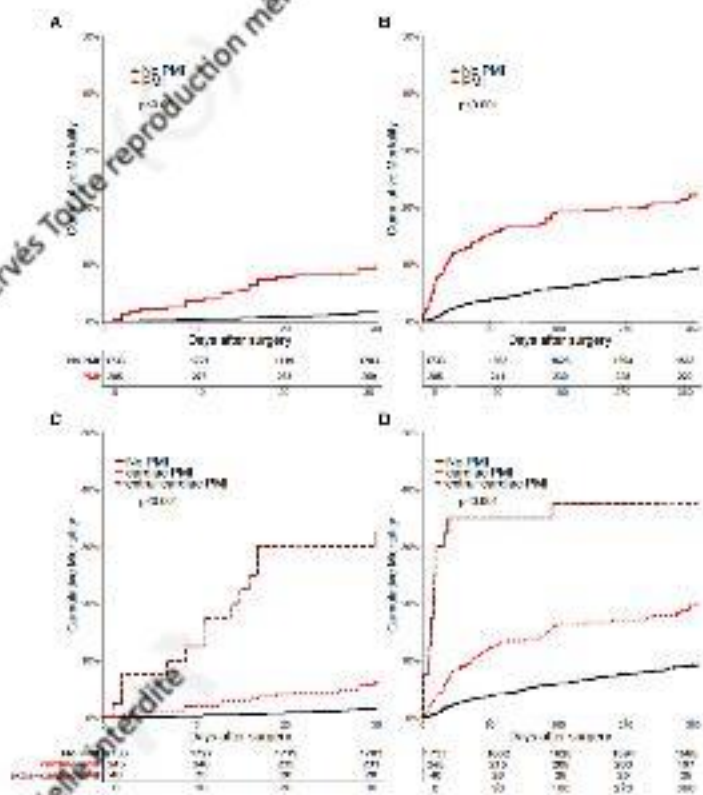
In patients who have known CVD, CV risk factors (including age $\geq 65$ years), or symptoms suggestive of CVD, it should be considered to measure BNP or NT-proBNP before intermediate- and high-risk NCS. <sup>52,104,112-114</sup>	IIa	B
In low-risk patients undergoing low- and intermediate-risk NCS, it is not recommended to routinely obtain pre-operative ECG, hs-cTn T/I, or BNP/NT-proBNP concentrations. <sup>109,111,117-119</sup>	IV	B



# Biomarqueurs

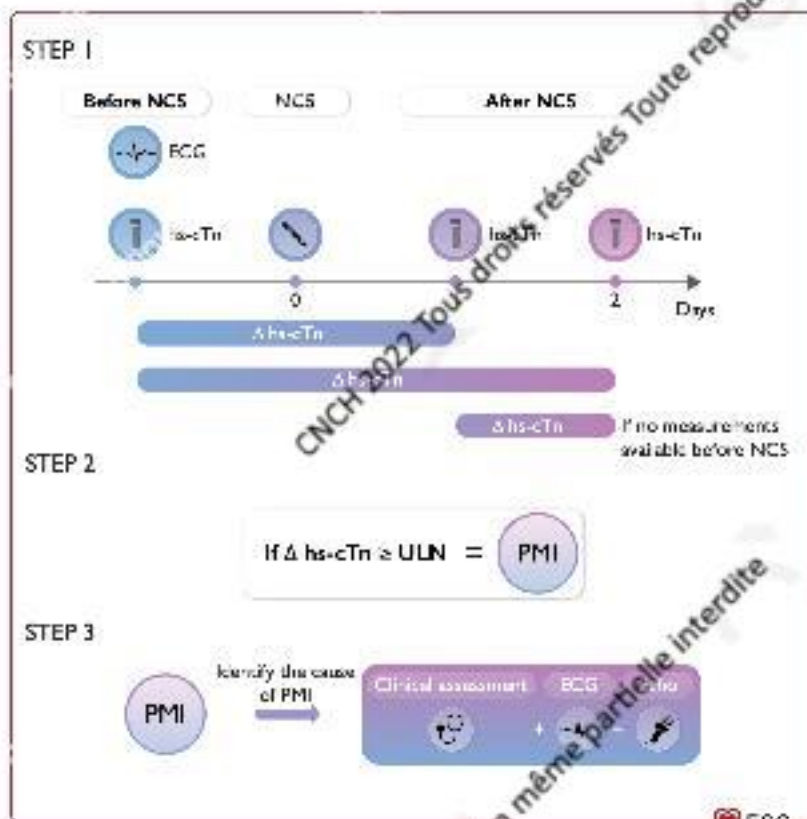
## Rôle péri-opératoire

- Détection et prise en charge PMI (Peri-operative myocardial infarction / Injury), 85% silencieux = négligés
- Puelacher C. et al. Circulation 2018



# PMI

## Peri-operative myocardial infarction / injury



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# Echographie cardiaque

Recommendation <sup>a</sup>	Class <sup>a</sup>	Level <sup>b</sup>
TTE is recommended in patients with poor functional capacity <sup>c</sup> and/or high NT-proBNP, BNP, <sup>d</sup> or if murmurs are detected before high-risk NCS, in order to undertake risk-reduction strategies. <sup>121,124,127-141-143</sup>	I	B
TTE should be considered in patients with suspected new CVD or unexplained signs or symptoms before high-risk NCS. <sup>59,124,125</sup>	IIa	B
TTE may be considered in patients with poor functional capacity, abnormal ECG, high NT-proBNP/BNP, <sup>d</sup> or >1 clinical risk factor before intermediate-risk NCS. <sup>126-128</sup>	IIb	B
To avoid delaying surgery, a FOCUS exam performed by trained specialists may be considered as an alternative to TTE for pre-operative triage. <sup>129,130,132,133,144</sup>	IIb	B
Routine pre-operative evaluation of LV function is not recommended. <sup>122,145</sup>	III	C

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# Imagerie de stress

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
Stress imaging is recommended before high-risk elective NCS in patients with poor functional capacity <sup>c</sup> and high likelihood of CAD <sup>d</sup> or high clinical risk. <sup>e,146,156-158</sup>	I	B
Stress imaging should be considered before high-risk NCS in asymptomatic patients with poor functional capacity <sup>e</sup> and previous PCI or CABG. <sup>147</sup>	IIa	C
Stress imaging may be considered before intermediate-risk NCS when ischaemia is of concern in patients with clinical risk factors and poor functional capacity. <sup>c,152,157,158</sup>	IIb	B
Stress imaging is not recommended routinely before NCS.	III	C

# Coroscanner (CCTA) / Coronarographie (ICA)

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
It is recommended to use the same indications for ICA and revascularization pre-operatively as in the non-surgical setting. <sup>90,146</sup>	I	C
CCTA should be considered to rule out CAD in patients with suspected CCS or biomarker-negative NSTEMI-ACS in case of low-to-intermediate clinical likelihood of CAD, or in patients unsuitable for non-invasive functional testing undergoing non-urgent, intermediate-, and high-risk NCS.	IIa	C

Pre-operative ICA may be considered in stable CCS patients undergoing elective surgical CEA. <sup>172</sup>	IIb	B
Routine pre-operative ICA is not recommended in stable CCS patients undergoing low- or intermediate-risk NCS.	III	C

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# Stratégies de réduction du risque

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
Smoking cessation >4 weeks before NCS is recommended to reduce post-operative complications and mortality. <sup>181,182</sup>	I	B
Control of CV risk factors—including blood pressure, dyslipidaemia, and diabetes—is recommended before NCS. <sup>173,176–178,183</sup>	I	B

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Interruption		
In patients without HF, withholding RAAS inhibitors on the day of NCS should be considered to prevent peri-operative hypotension. <sup>215,216</sup>	IIa	B
For patients on diuretics to treat hypertension, transient discontinuation of diuretics on the day of NCS should be considered. <sup>236</sup>	IIa	B
It should be considered to interrupt SGLT-2 inhibitor therapy for at least 3 days before intermediate- and high-risk NCS.	IIa	C

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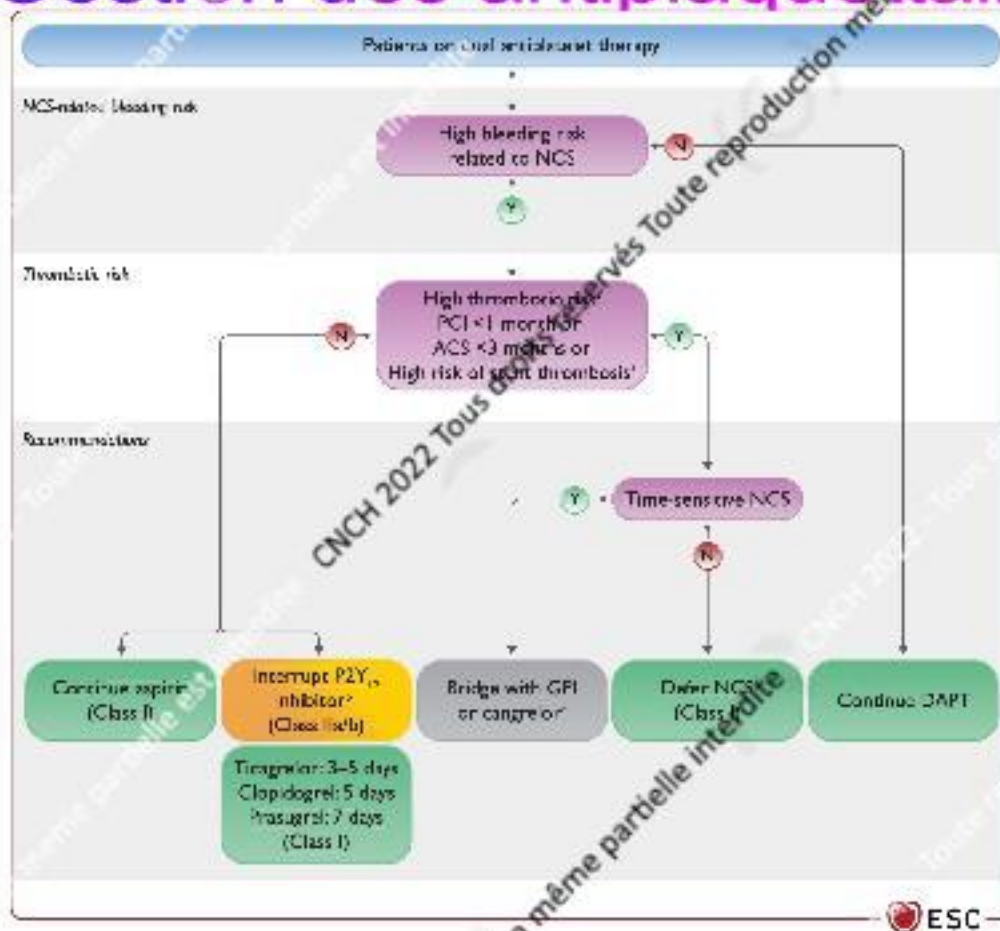
Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
<b>Initiation</b>		
In patients with an indication for statins, it should be considered to initiate statins peri-operatively.	IIa	C
Pre-operative initiation of beta-blockers in absence of high-risk NCS may be considered in patients who have two or more clinical risk factors, <sup>c</sup> in order to reduce the incidence of perioperative myocardial infarction. <sup>198,199,247</sup>	IIb	A
Pre-operative initiation of beta-blockers in absence of NCS may be considered in patients who have known CAD or myocardial infarction. <sup>200–202</sup>	IIb	B
Routine initiation of beta-blockers peri-operatively is not recommended. <sup>162, 197,199,223,227</sup>	III	A
<b>Continuation</b>		
Peri-operative continuation of beta-blockers is recommended in patients currently receiving this medication. <sup>198,199,249</sup>	I	B
In patients already on statins, it is recommended to continue statins during the peri-operative period. <sup>245</sup>	I	B
In patients with stable HF, peri-operative continuation of RAAS inhibitors may be considered.	IIb	C

# Gestion péri-opératoire des antithrombotiques

## Classification des chirurgies en fonction du risque hémorragique

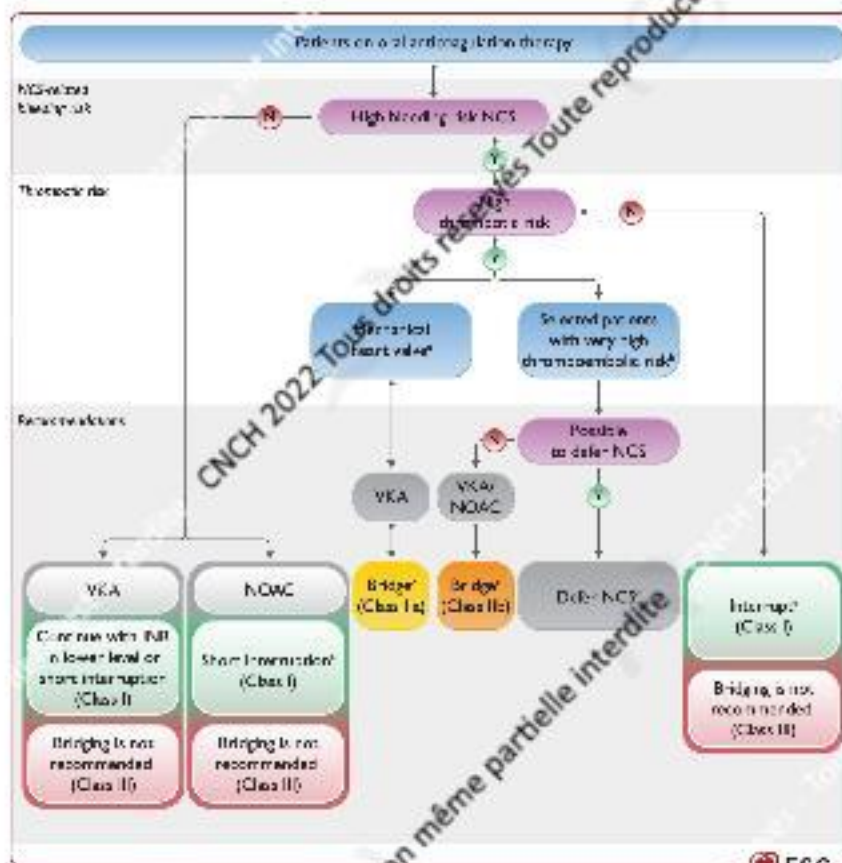
Surgery with minor bleeding risk	Surgery with low bleeding risk (infrequent or with low clinical impact)	Surgery with high bleeding risk (frequent or with significant clinical impact)
<ul style="list-style-type: none"> <li>Cataract or glaucoma procedure</li> <li>Dental procedures: extractions (1-3 teeth), periodontal surgery, implant positioning, endodontic (root canal) procedures, subgingival scaling/cleaning</li> <li>Endoscopy without biopsy or resection</li> <li>Superficial surgery (e.g. abscess incision, small skin excision/ biopsy)</li> </ul>	<ul style="list-style-type: none"> <li>Abdominal surgery: cholecystectomy, hernia repair, minor resection</li> <li>Breast surgery</li> <li>Complex dental procedures (multiple tooth extractions)</li> <li>Endoscopy with simple biopsy</li> <li>Gastroscopy or colonoscopy with simple biopsy</li> <li>Large-bore nasals procedures (eg. bone marrow or lymph node biopsy)</li> <li>Non-contact ophthalmic surgery</li> <li>Small orthopaedic surgery (foot, hand arthroscopy)</li> </ul>	<ul style="list-style-type: none"> <li>Abdominal surgery with liver biopsy, extracorporeal shockwave lithotripsy</li> <li>Extensive cancer surgery (eg. pancreas, liver)</li> <li>Neuraxial (spinal or epidural) anaesthesia</li> <li>Neurosurgery (intracranial, spinal)</li> <li>Major orthopaedic surgery</li> <li>Procedures with vascular organ biopsy (kidney or prostate)</li> <li>Reconstructive plastic surgery</li> <li>Specific interventions (colon polypectomy, lumbar puncture, intravascular aneurysm repair)</li> <li>Thoracic surgery, lung resection surgery</li> <li>Urologic surgery (prostatectomy, bladder tumour resection)</li> <li>Vascular surgery (eg. AAA repair, vascular bypass)</li> </ul>

# Gestion des antiplaquettes

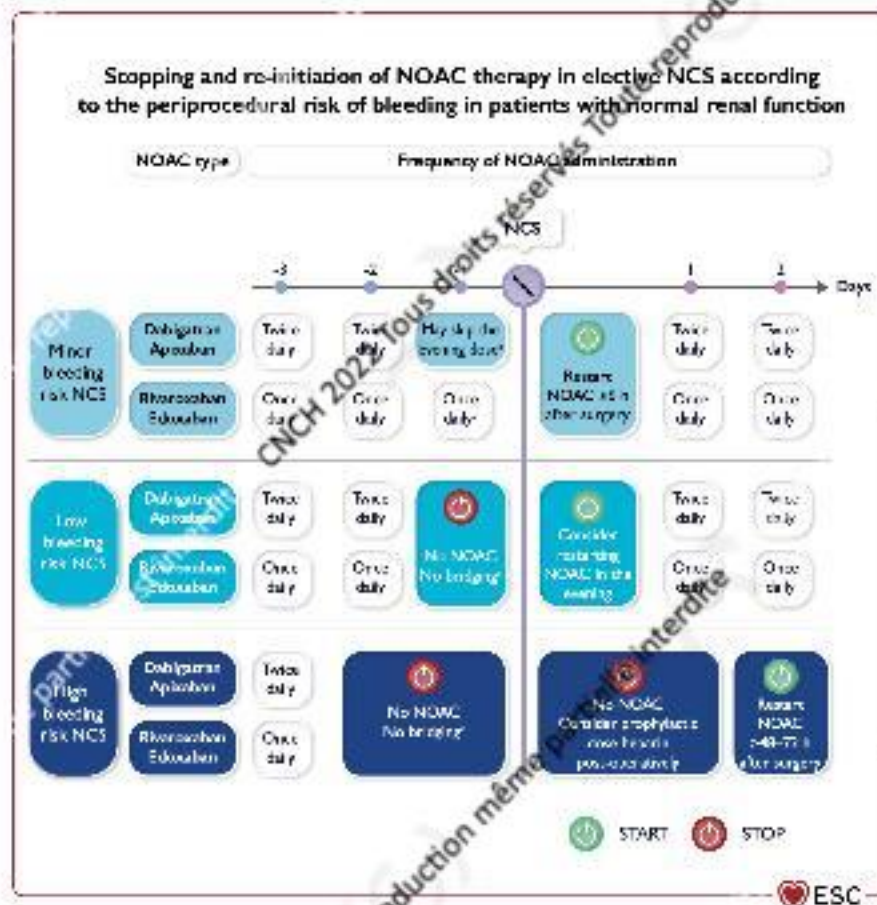




# Anticoagulants oraux



# Gestion des anticoagulants oraux



# Maladie coronaire

**Recommendation Table 19 — Recommendations for the timing of non-cardiac surgery and revascularization in patients with known coronary artery disease**

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
<b>Patients with CCS</b>		
If PCI is indicated before NCS, the use of new-generation DES is recommended over BMS and balloon angioplasty. <sup>261</sup>	I	A
Pre-operative evaluation of patients with an indication for PCI by an expert team (surgeon and cardiologist) should be considered before elective NCS.	IIa	C
Myocardial revascularization before high-risk elective NCS may be considered, depending on the amount of ischaemic myocardium, refractory symptoms, and findings at coronary angiography (as in the case of left main disease). <sup>499,1027,1028</sup>	IIb	B
Routine myocardial revascularization before low- and intermediate-risk NCS in patients with CCS is not recommended. <sup>199,403</sup>	III	B

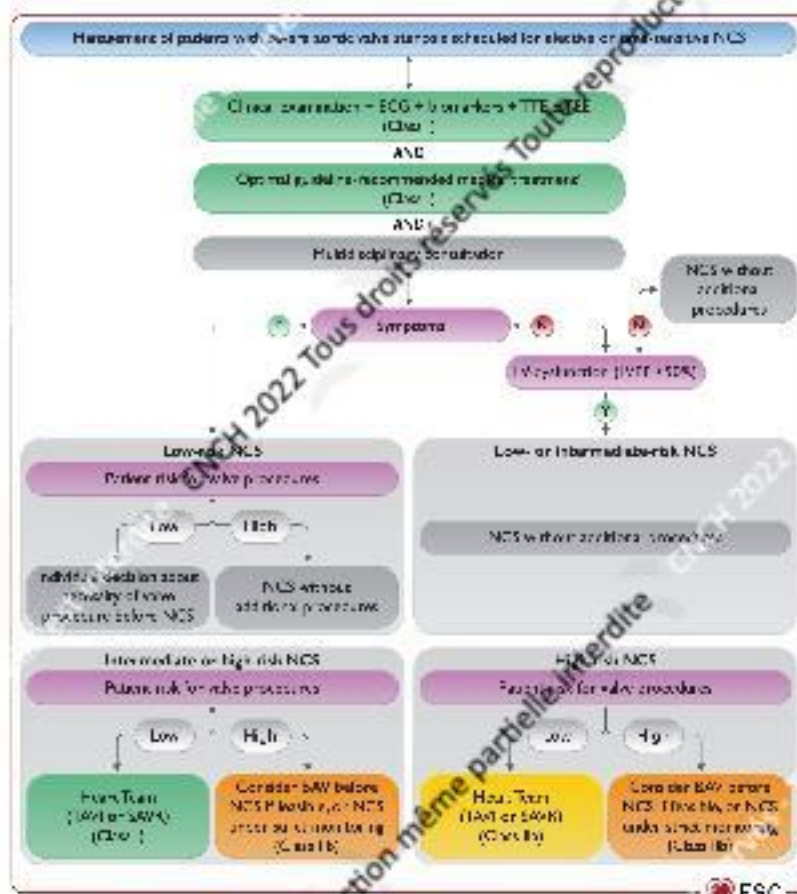
## Patients with ACS

If NCS can safely be postponed (e.g. at least 3 months), it is recommended that patients with ACS being scheduled for NCS undergo diagnostic and therapeutic interventions as recommended for ACS patients in general.<sup>90,260</sup>

In the unlikely combination of a life-threatening clinical condition requiring urgent NCS, and NSTEMI-ACS with an indication for revascularization, the priorities for surgery on a case-by-case basis should be considered by the expert team.<sup>269</sup>

I	A
IIa	C

# Rétrécissement aortique serré



## Limites

- Nombre de patients : 22 millions patients ont une chirurgie majeure chaque année en Europe
- > 50% patients de 45 ans ou plus ont déjà 2 FDRCV
- Biomarqueurs (troponine post-op ...)
- Qui fait l'évaluation en France ? L'anesthésiste, le cardiologue ? A organiser en staffs multidisciplinaires

# Conclusion

- Nouvel algorithme (plus de score de risque global) pour stratifier le risque clinique du patient
- Age 65 ans
- Biomarqueurs : troponine, BNP ou NT-proBNP
- Gestion antiplaquettaires et anticoagulants pré- et post-op : clarification et simplification
- Prise en charge invasive des valvulopathies significatives avant chirurgie non urgente
- Equipe multidisciplinaire
- Information patient (écrite et orale).