

Guia de pràctica clínica dels pacients amb risc cardiovascular sotmesos a cirurgia no cardíaca.

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Objetivo de la evaluación preoperatoria

- Mejorar las estrategias de prevención y limitar el riesgo operatorio
- Disminuir la incidencia de complicaciones perioperatorias
- American Heart Association y el American College of Cardiologist (AHA/ACC)
- European Society of Cardiology y European Society of Anesthesiology (ESC / ESA)
- Facilitar la implementación de las guías a la práctica clínica habitual.

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ACC/AHA Guideline

ACC/AHA 2007 Guidelines on Perioperative Cardiovascular Evaluation and Care for Noncardiac Surgery: Executive Summary

**A Report of the American College of Cardiology/American Heart
Association Task Force on Practice Guidelines (Writing Committee to
Revise the 2002 Guidelines on Perioperative Cardiovascular Evaluation for
Noncardiac Surgery)**

*Developed in Collaboration With the American Society of Echocardiography, American Society of
Nuclear Cardiology, Heart Rhythm Society, Society of Cardiovascular Anesthesiologists, Society
for Cardiovascular Angiography and Interventions, Society for Vascular Medicine and Biology,
and Society for Vascular Surgery*



Guidelines for pre-operative cardiac risk assessment and perioperative cardiac management in non-cardiac surgery

The Task Force for Preoperative Cardiac Risk Assessment and Perioperative Cardiac Management in Non-cardiac Surgery of the European Society of Cardiology (ESC) and endorsed by the European Society of Anaesthesiology (ESA)

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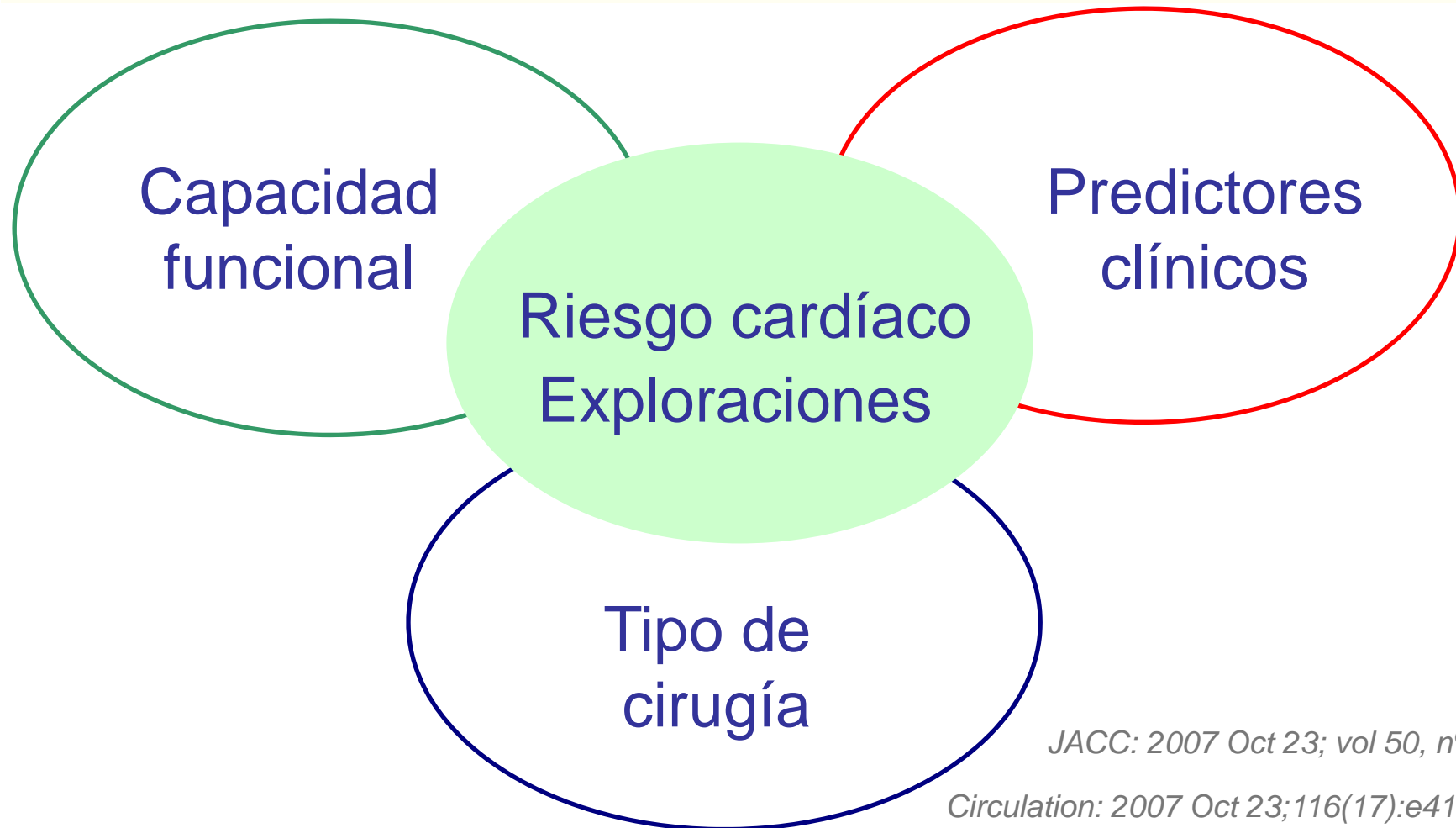
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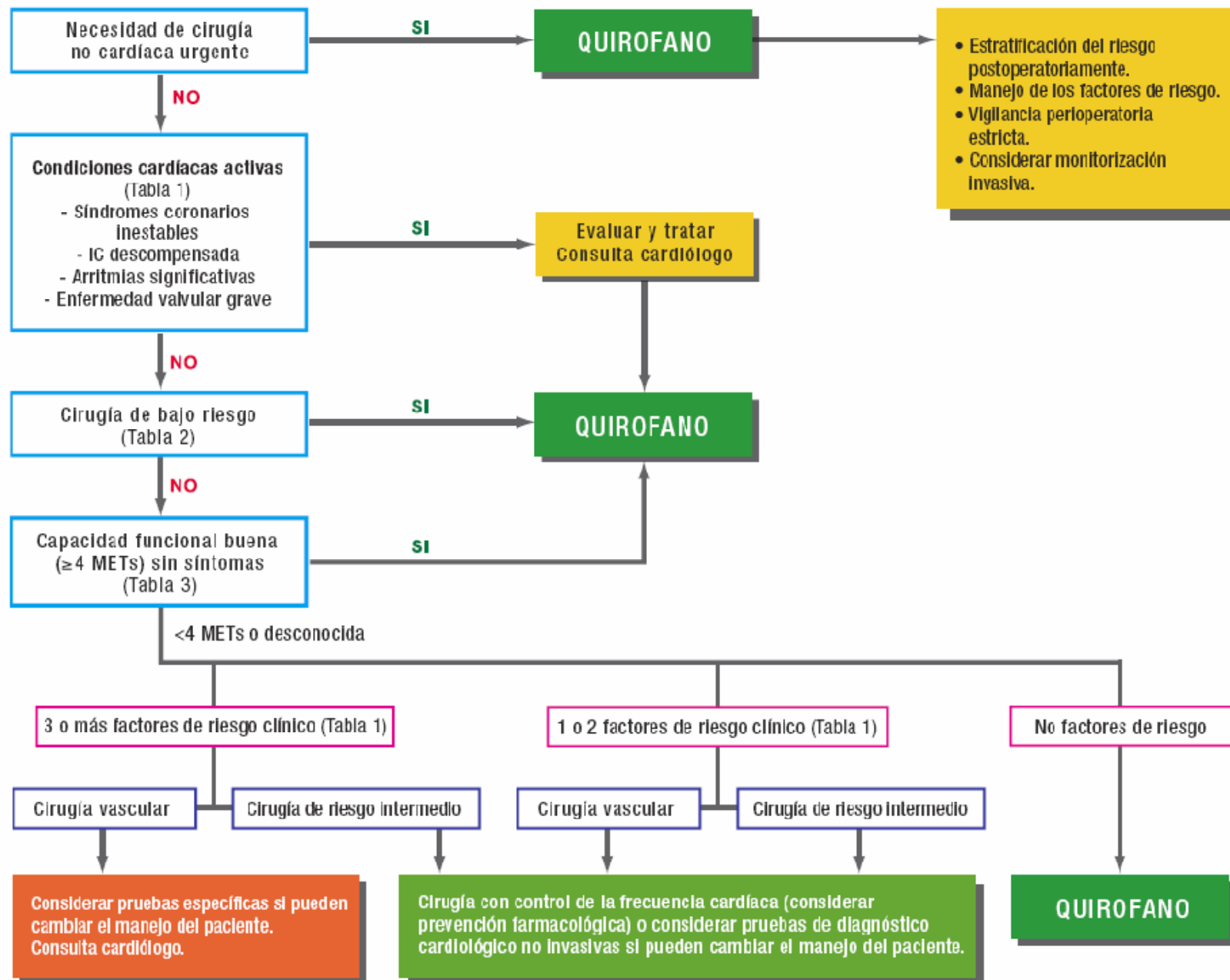
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ACC/AHA 2007 Guidelines on Perioperative Cardiovascular Evaluation and Care for Noncardiac Surgery



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- **GUIA PRACTICA DE ACTUACIÓN PREOPERATORIA DEL PACIENTE CARDIOPATA EN LA CIRUGIA NO CARDIACA**
- **Recomendación clase 1**
- **Nivel de evidencia B**

TABLE 1. Class Recommendations and Levels of Evidence (LOEs)

Class	
I	Benefit >>> risk; treatment is recommended and indicated
IIa	Benefit >> risk; reasonable to perform treatment, which is likely to be effective and beneficial
IIb	Benefit \geq risk; treatment might be considered, but benefit is less well established
III	Risk \geq benefit; treatment not recommended, may be harmful
LOE	
A	Sufficient evidence from multiple population risk studies, randomized trials, or meta-analyses
B	Generally supportive evidence from limited population risk studies, randomized trials, or meta-analyses
C	Very limited literature support or expert/committee consensus opinion

- La evaluación de un paciente de riesgo cardiovascular debe incluir:
 - **Historia clínica completa**
 - **Examen físico**
 - **Pruebas de laboratorio**
 - **Radiología de tórax**
 - **ECG en reposo**
- La historia clínica y la exploración física nos permiten detectar con bastante acierto los factores de riesgo de un determinado paciente.

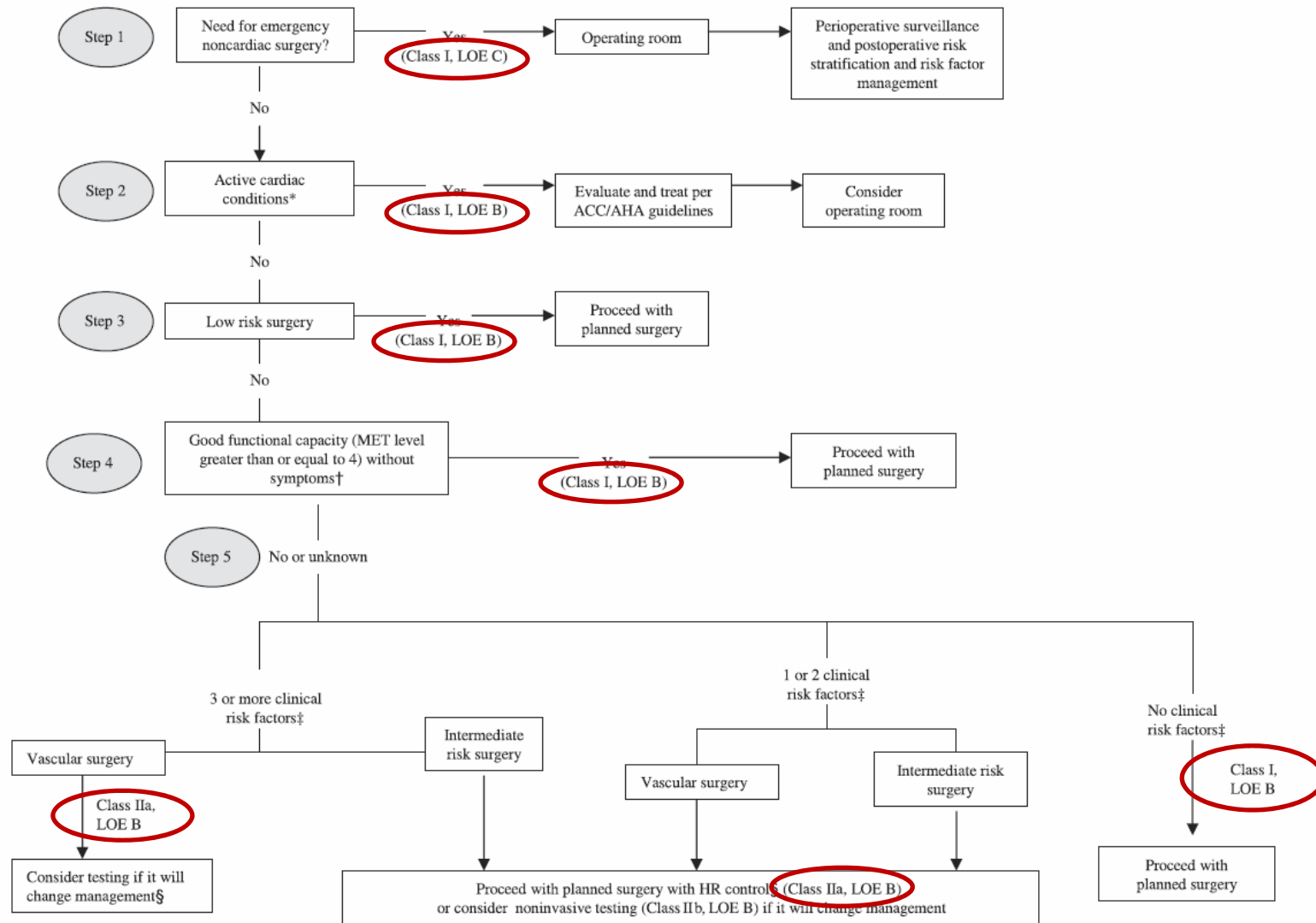
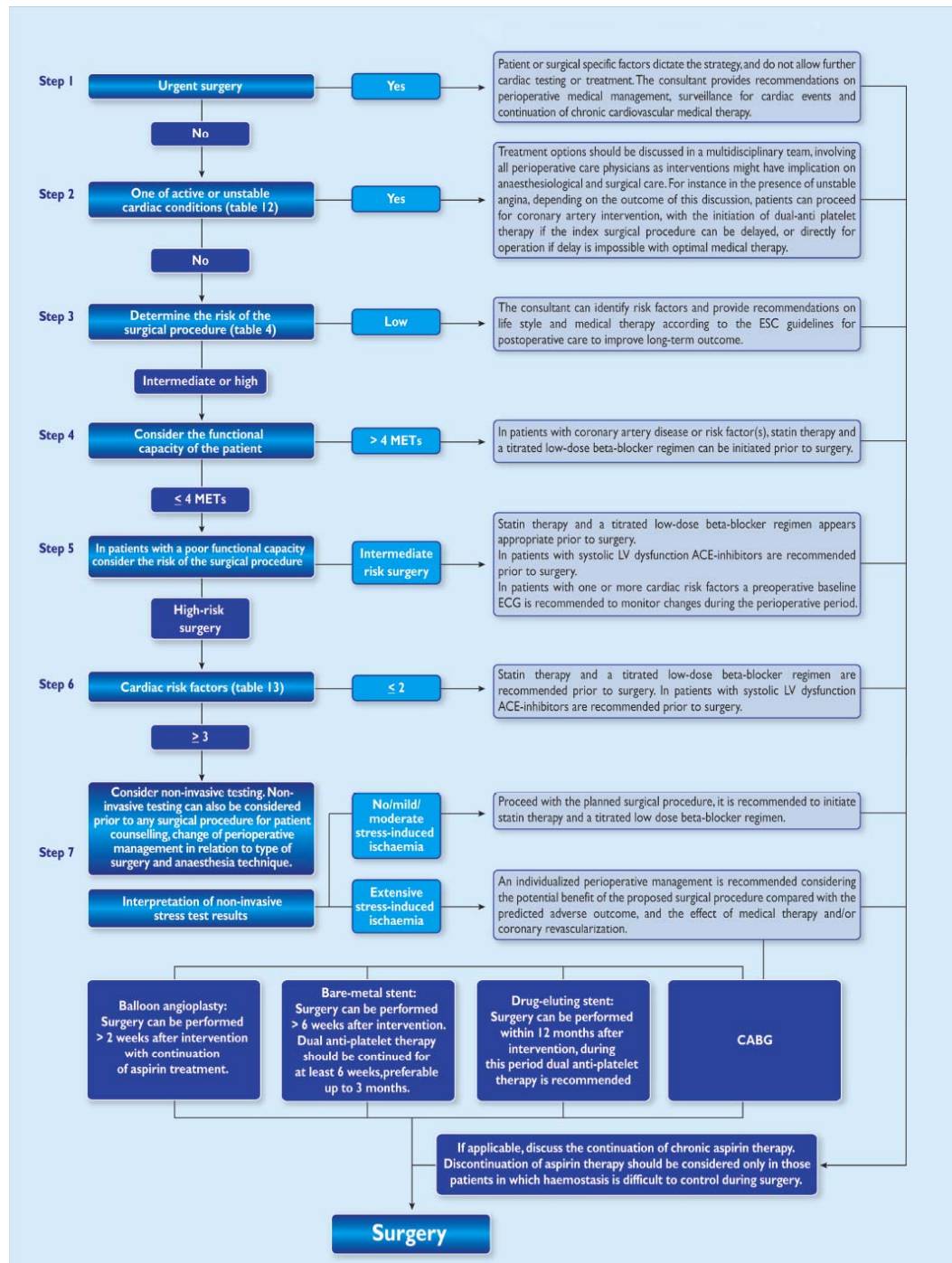


Figure 1. Cardiac evaluation and care algorithm for noncardiac surgery based on active clinical conditions, known cardiovascular disease, or cardiac risk factors for patients 50 years of age or greater. *See Table 2 for active clinical conditions. †See Table 3 for estimated MET level equivalent. ‡Clinical risk factors include ischemic heart disease, compensated or prior HF, diabetes mellitus, renal insufficiency, and cerebrovascular disease. §Consider perioperative beta blockade (see Table 11) for populations in which this has been shown to reduce cardiac morbidity/mortality. ACC/AHA indicates American College of Cardiology/American Heart Association; HR, heart rate; LOE, level of evidence; and MET, metabolic equivalent.



5 preguntas

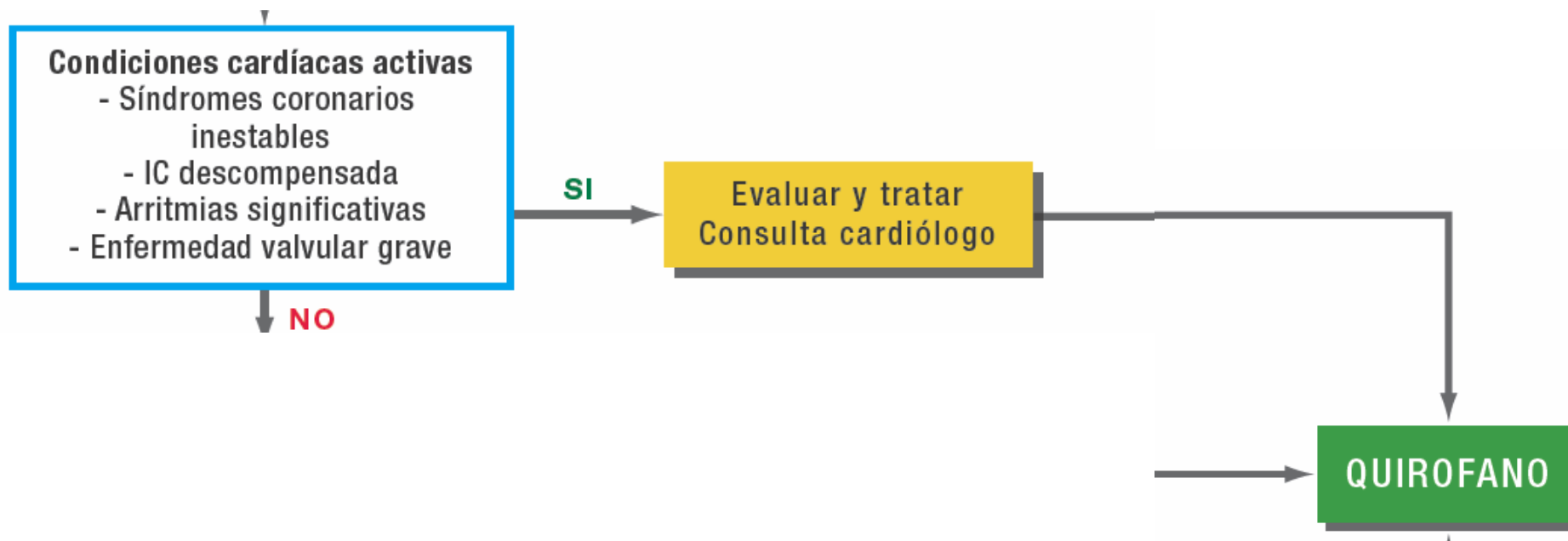
- **¿Se trata de una cirugía urgente?**
- **¿Tiene el paciente una condición cardíaca activa?**
- **¿Qué riesgo cardíaco inherente tiene la cirugía propuesta?**
- **¿Tiene el paciente una buena capacidad funcional sin síntomas?**
- **¿Tiene el paciente factores clínicos de riesgo?**

¿Se trata de una cirugía urgente?



	Urgencia no diferible	Programada
	242	3143
Complicaciones perioperatorias	33 (13,6 %)	291 (9,3 %)
Complicaciones cardiovasculares	10 (4,1%)	127 (4,0%)
Mortalidad cardiovascular	2 (0,8%)	8 (0,3%)
Mortalidad global	6 (2,5%)	56 (1,8%)

¿Tiene el paciente una condición cardíaca activa?



Condición cardíaca activa	Sí	No
	115	3022
Complicaciones perioperatorias	26 (22,6%)	265 (8,8%)
Complicaciones cardiovasculares	14 (53,8%)	113 (42,6%)
Mortalidad cardiovascular	4 (3,5%)	4 (0,1%)
Mortalidad global	5 (4,3%)	57 (1,9%)

Condiciones cardiacas activas

- **- Síndromes coronarios inestables**
 - Angina grave o inestable (Clase III – IV de la Canadian Cardiovascular Society). Puede incluir angina estable en pacientes muy sedentarios.
 - Infarto de miocardio reciente: inferior a un mes.
- **- Insuficiencia cardíaca descompensada**
 - (Clase funcional NYHA IV, empeoramiento o aparición de novo).
- **- Arritmias significativas**
 - Bloqueo AV avanzado (Mobitz II o 3 grado).
 - Arritmias ventriculares sintomáticas.
 - Arritmia supraventricular (FA frecuencia >100 x min).
 - Bradicardia sintomática.
 - Taquicardia ventricular de nueva aparición.
- **- Enfermedad valvular grave**
 - Estenosis aórtica grave: gradiente de presión media ≥ 40 mm Hg, área valvular < 1 cm², o sintomática.
 - Estenosis mitral sintomática: disnea progresiva al esfuerzo, presíncope al esfuerzo o insuficiencia cardíaca.

¿Qué riesgo cardiaco inherente tiene la cirugía propuesta?



Riesgo quirúrgico	Intermedi	Alt
	2901	120
Complicaciones perioperatorias	247 (8,5%)	18 (15%)
Complicaciones cardiovasculares	107 (3,7%)	6 (5%)
Mortalidad cardiovascular	0 (0%)	4 (3,3)
Mortalidad global	45 (1,6%)	6 (5%)

Estratificación del riesgo cardíaco para cirugía no-cardíaca:

- **Vascular** (riesgo de complicaciones cardíacas > 5 %)
 - Cirugía aórtica y mayor vascular
 - Cirugía vascular periférica
- **Riesgo intermedio** (riesgo de complicaciones cardíacas entre 1 % y 5%)
 - Cirugía intratorácica y intraperitoneal
 - Endarterectomía carotídea
 - Cirugía de cabeza y cuello
 - Cirugía ortopédica
 - Cirugía de próstata
 - Cirugía endovascular
- **Riesgo bajo** (riesgo de complicaciones cardíacas < 1 %)
 - Procedimientos endoscópicos
 - Procedimientos superficiales (piel-subcutáneo)
 - Cirugía de catarata
 - Cirugía mamaria
 - Cirugía ambulatoria

Cirugía laparoscópica

Recommendation/statement on surgical risk estimate

Recommendation/statement	Class ^a	Level ^b
Laparoscopic procedures demonstrate a cardiac stress similar to open procedures and it is recommended that patients be screened prior to intervention accordingly	I	A

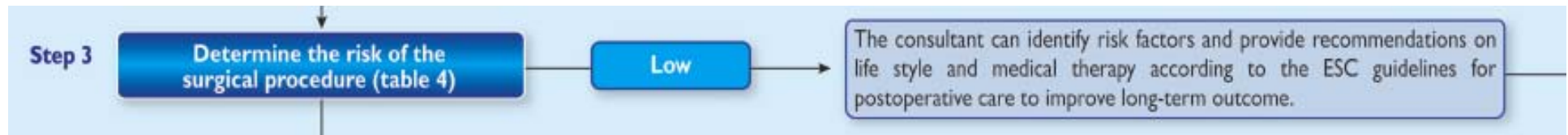
^aClass of recommendation.

^bLevel of evidence.

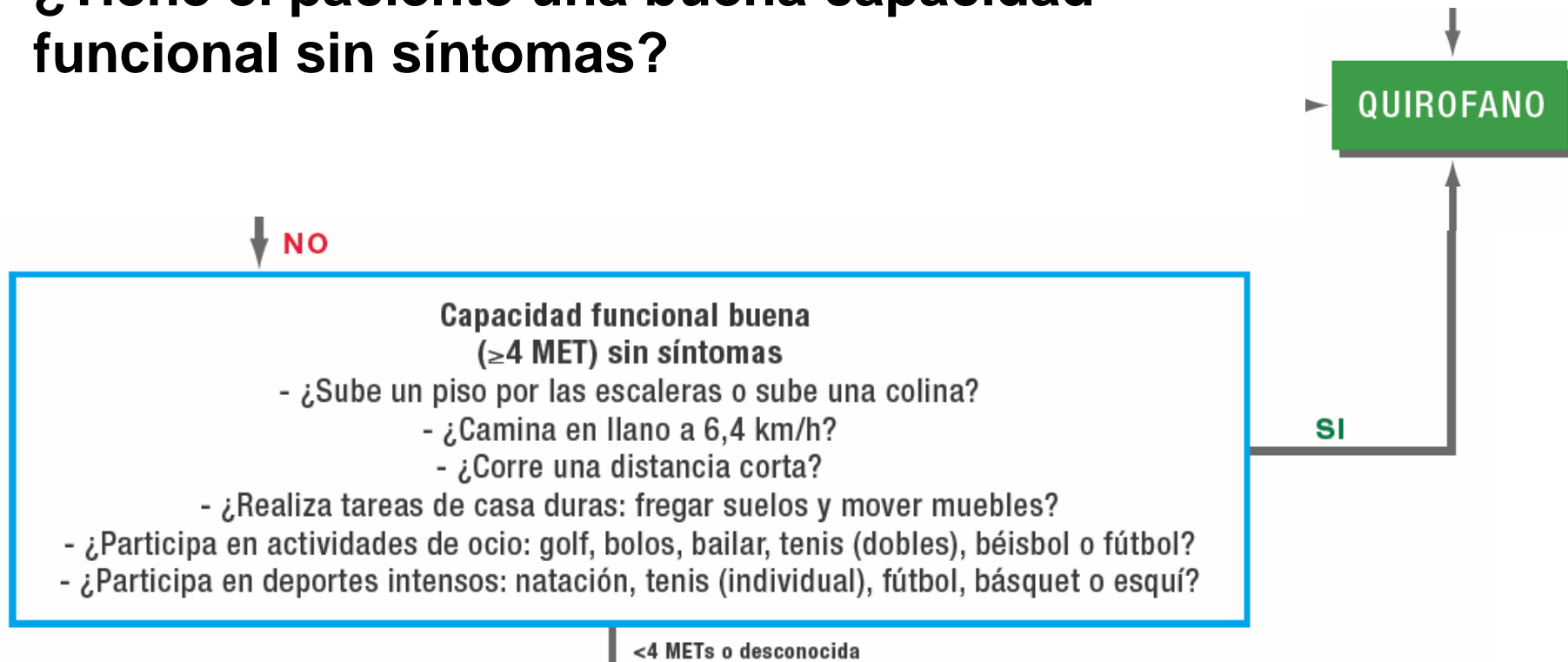
Cirugía laparoscópica = cirugía abierta

Cirugía de bajo riesgo de complicaciones

- El consultor puede y debe identificar factores clínicos de riesgo y dar recomendaciones tanto en el estilo de vida como en el tratamiento para mejorar los resultados a largo plazo



¿Tiene el paciente una buena capacidad funcional sin síntomas?



METs < 4 o desconocida	Sí	No
	1219	1803
Complicaciones perioperatorias	143 (11,7%)	122 (6,8)
Complicaciones cardiovasculares	63 (5,2%)	50 (2,8)
Mortalidad cardiovascular	3 (0,2%)	1 (0,06%)
Mortalidad global	36 (2,9%)	15 (0,8%)

Capacidad funcional según los equivalentes metabólicos

1 MET

¿Puede cuidar de si mismo?
¿Come, se viste y hace sus necesidades solo?
¿Andar y desplazarse por casa?
¿Caminar 1 o 2 manzanas por llano? [4 -5 Km/h]
¿Trabajos domésticos suaves?



4 METS

¿Realiza tareas de casa: limpiar el polvo, fregar platos, etc)?
Subir un piso por las escaleras o cuesta
Caminar por llano y rápido [6,4 Km/h]
Corre una distancia corta?
Trabajos domésticos pesados, levantar muebles, fregar suelos...
Actividades de ocio moderadas: tenis [dobles], golf, bailar, béisbol
...



>10 METS

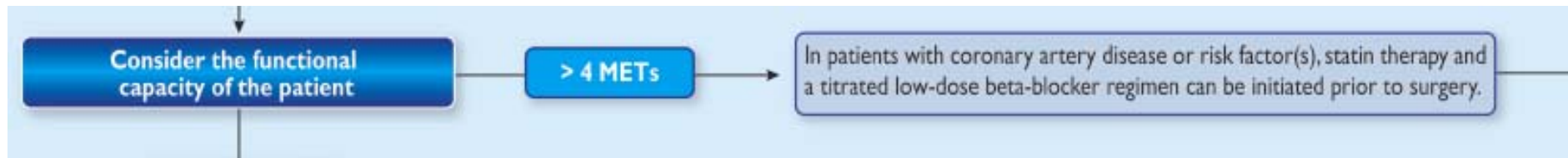
Deportes extenuantes: natación, tenis individuales, fútbol, baloncesto o esquí.

Hlatky MA, Boineau RE, Higginbotham MB, Lee KL, Mark DB, Califf RM, Cobb FR, Pryor DB. A brief self-administered questionnaire to determine functional capacity (the Duke Activity Status Index). Am J Cardiol 1989;64:651-654.

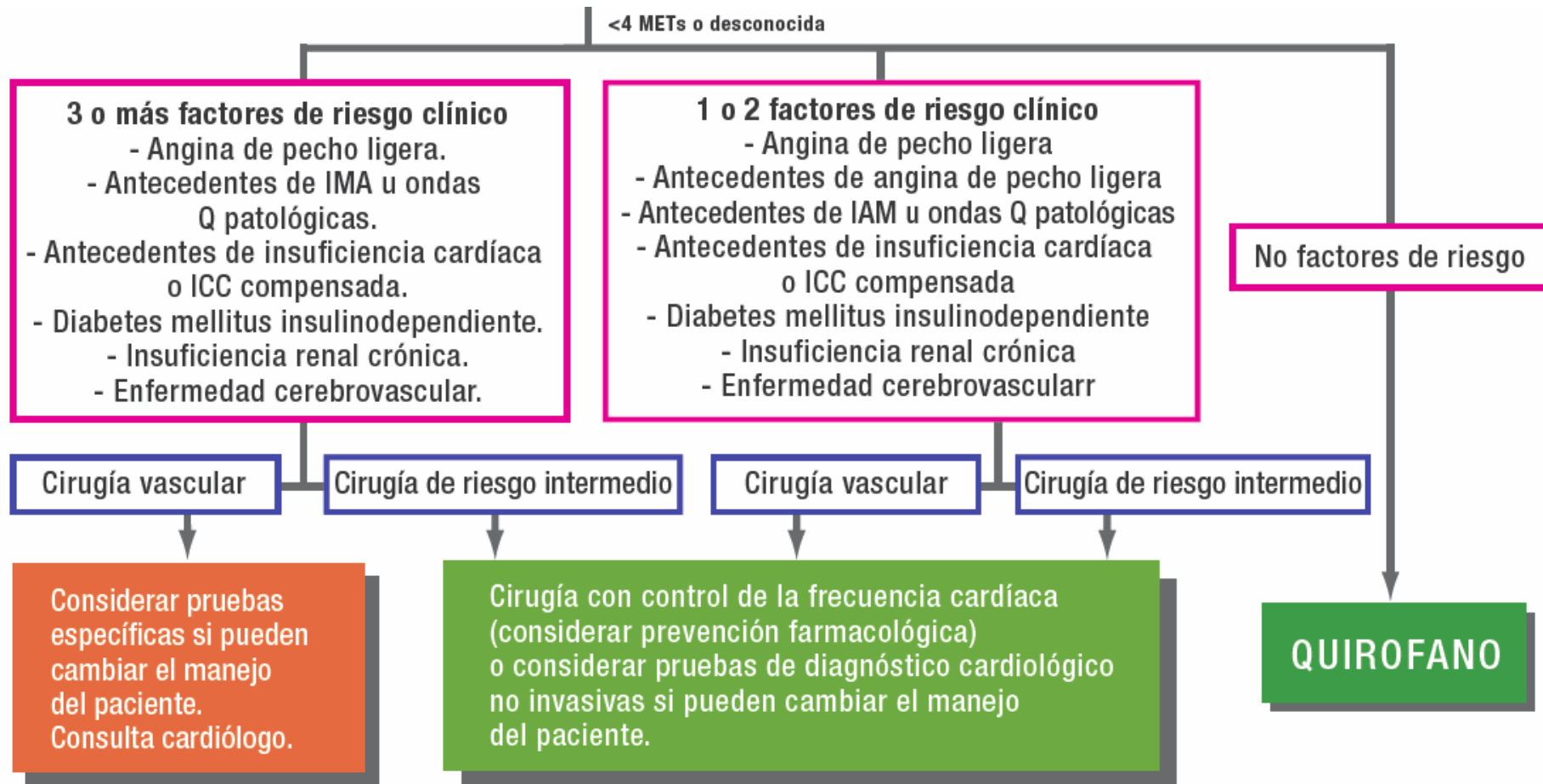
Fletcher GF, Balady GJ, Amsterdam EA, Chaitman B, Eckel R, Fleg J, Froelicher VF, Leon AS, Pina IL, Rodney R, Simons-Morton DA, Williams MA, Bazzarre T. Exercise standards for testing and training: a statement for healthcare professionals from the American Heart Association. Circulation 2001;104:1694-1740.

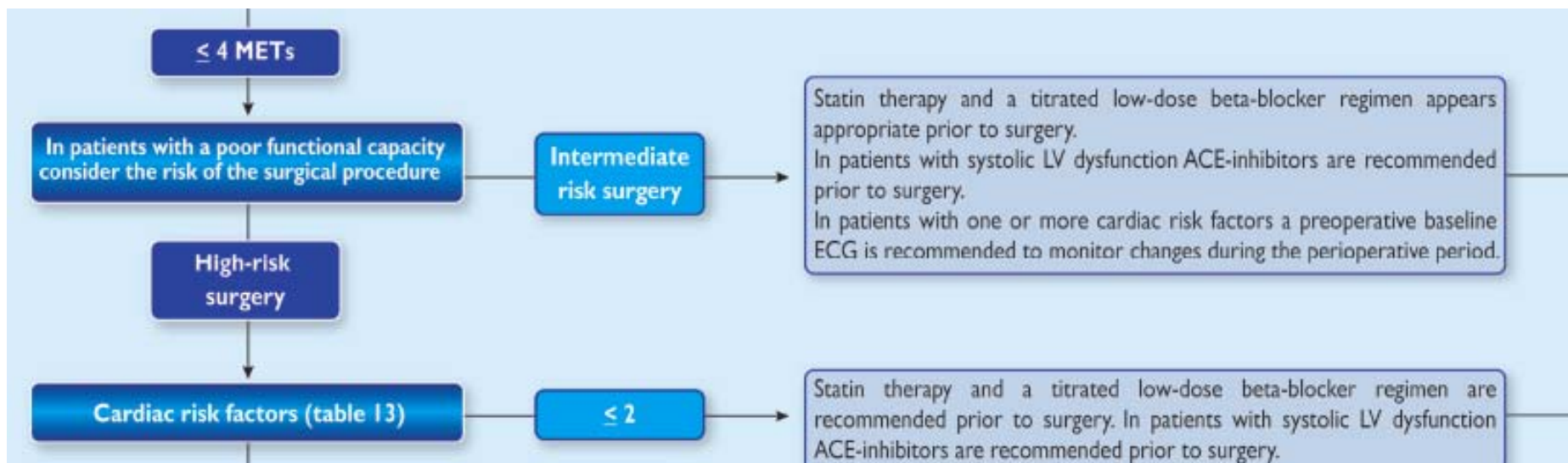
- Un equivalente metabólico (1 MET) corresponde a la cantidad de oxígeno consumido en reposo (3,5 ml de O₂ /Kg/min).
- Toda capacidad funcional < 4 METs se considera pobre.
- Preguntas claves:
 - ¿Puede Ud. caminar en plano 4 manzanas de casas sin parar por síntomas limitantes?
 - ¿Puede subir dos pisos por la escalera sin parar por síntomas limitantes?

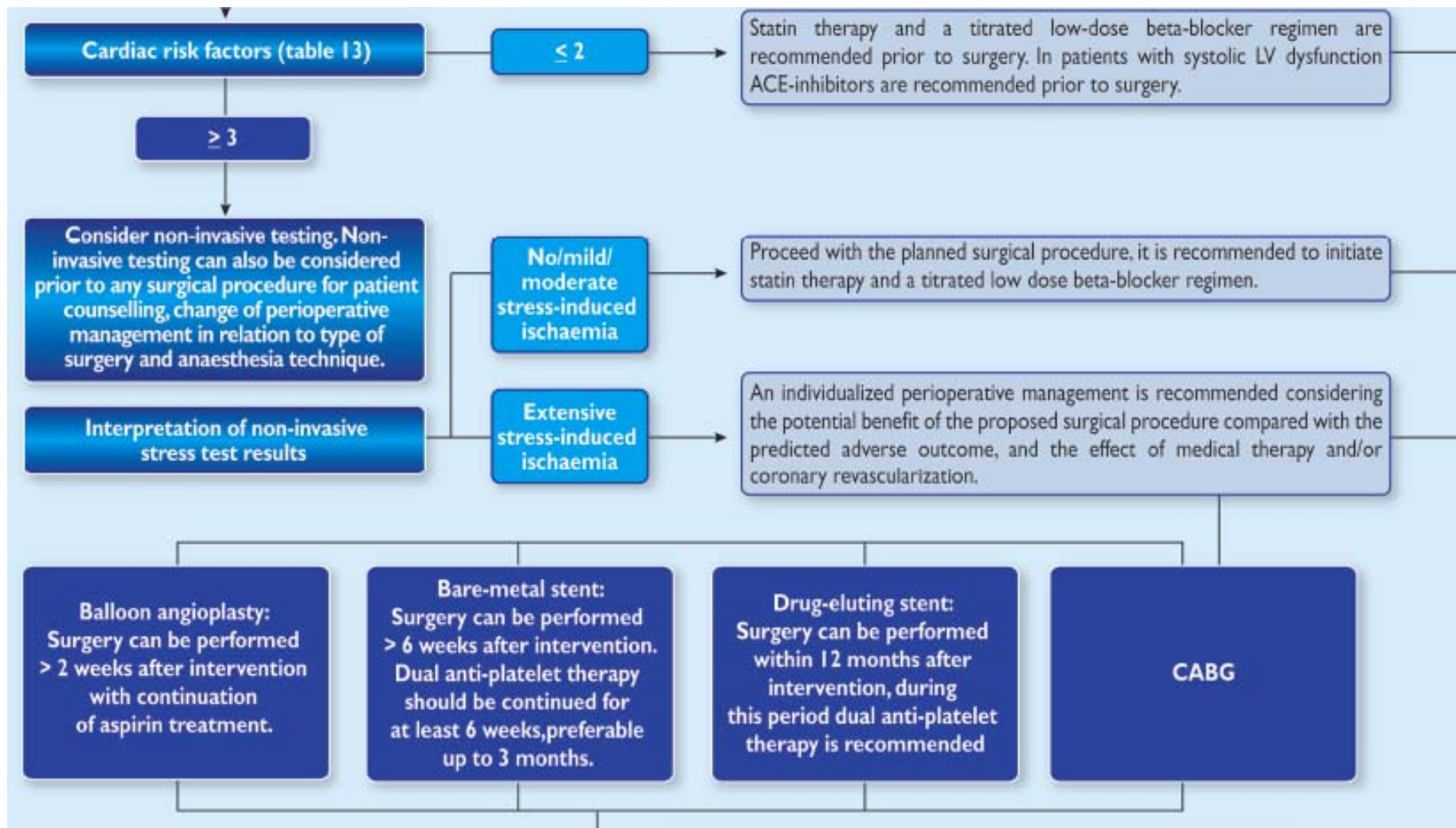
- Puede ser recomendable que los pacientes con cardiopatía isquémica conocida o factores de riesgo iniciar estatinas y betabloqueantes a dosis bajas previo a la cirugía.



¿Tiene el paciente factores clínicos de riesgo?







Factores de riesgo	No	1 -2 factors	>= 3 factors
	721	432	53
Complicaciones perioperatorias	62 (8,6%)	64 (14,8%)	16 (30,2%)
Complicaciones cardiovasculares	25 (3,5%)	27 (6,3%)	11 (20,7%)
Mortalidad cardiovascular	0 (0%)	1 (0,2%)	2 (3,8%)
Mortalidad global	14 (1,9%)	15 (3,5%)	7 (13,2%)

Factores clínicos de riesgo

- **Cardiopatía isquémica definida como**
 - Historia clínica de infarto de miocardio
 - Historia clínica o clínica actual de angina de pecho
 - Uso sublingual de nitroglicerina
 - Prueba de esfuerzo positiva
 - Ondas Q en el ECG
 - Pacientes que ha sufrido una revascularización coronaria (Angioplastia o cirugía) y que tienen dolor torácico de probable origen cardiológico.
- **Insuficiencia cardíaca definida como**
 - Fallo ventricular izquierdo por exploración clínica*
 - Historia de disnea paroxística nocturna
 - Historia de edema pulmonar
 - S3 o roncus bilateral en la exploración física
 - Edema pulmonar en la radiografía de tórax
- **Enfermedad cerebrovascular definida por**
 - Historia de TIA
 - Historia de AVC
- **Diabetes mellitus insulino dependiente**
- **Insuficiencia renal crónica definida como**
 - Creatinina basal > 2 mg/dl

Utilización de escalas de riesgo

Recommendations/statements on cardiac risk stratification

Recommendations/statements	Class ^a	Level ^b
It is recommended clinical risk indices be used for post-operative risk stratification	I	B
It is recommended that the Lee index model applying six different variables for perioperative cardiac risk be used	I	A

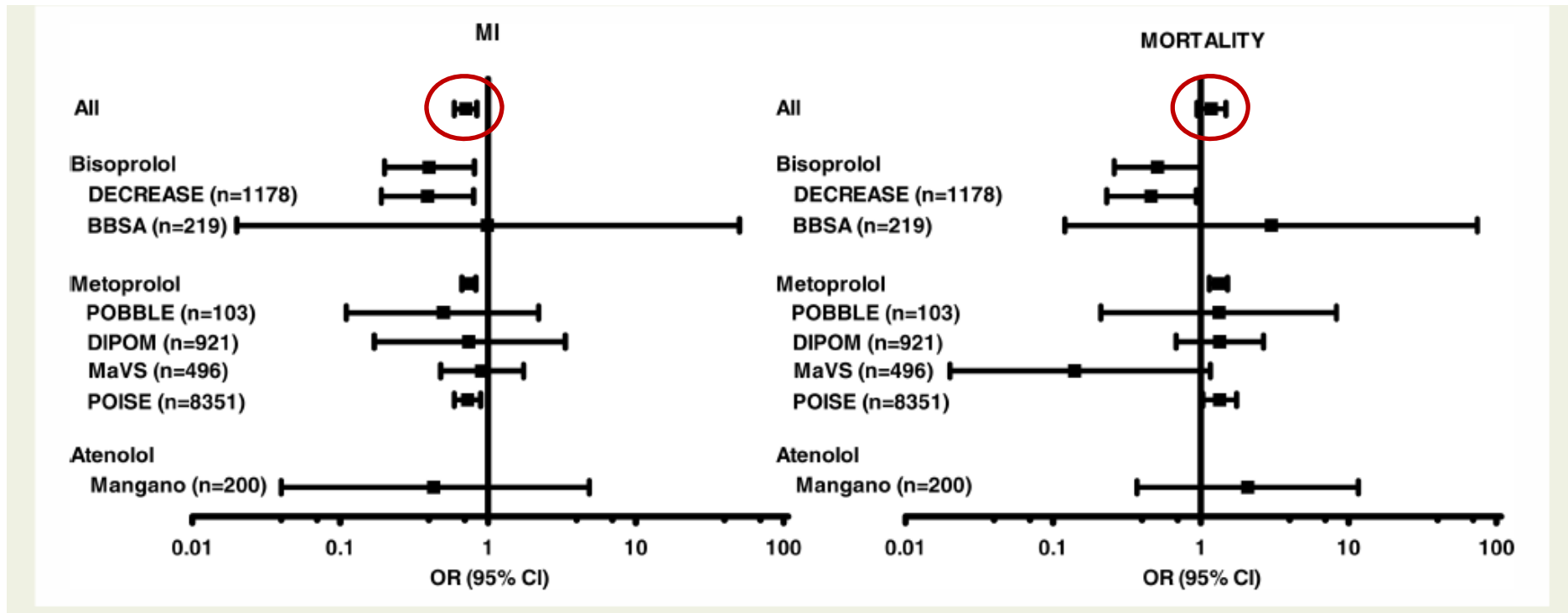
^aClass of recommendation.

^bLevel of evidence.

Estrategias para la disminución del riesgo

- Betabloqueantes
- Estatinas
- Nitritos
- IECAS
- Antagonistas del calcio
- Diuréticos
- Aspirina

Betabloqueantes



Recommendations on β -blockers^a

Recommendations	Class ^b	Level ^c
β -Blockers are recommended in patients who have known IHD or myocardial ischaemia according to pre-operative stress testing ^a	I	B
β -Blockers are recommended in patients scheduled for high-risk surgery ^a	I	B
Continuation of β -blockers is recommended in patients previously treated with β -blockers because of IHD, arrhythmias, or hypertension	I	C
β -Blockers should be considered for patients scheduled for intermediate-risk surgery ^a	IIa	B
Continuation in patients previously treated with β -blockers because of chronic heart failure with systolic dysfunction should be considered	IIa	C
β -Blockers may be considered in patients scheduled for low-risk surgery with risk factor(s)	IIb	B
Perioperative high-dose β -blockers without titration are not recommended	III	A
β -Blockers are not recommended in patients scheduled for low-risk surgery without risk factors	III	B

^aTreatment should be initiated optimally between 30 days and at least 1 week before surgery. Target: heart rate 60–70 beats/min, systolic blood pressure > 100 mmHg.

^bClass of recommendation.

^cLevel of evidence.

IHD = ischaemic heart disease.

- **Se recomiendan:**
 - Cardiopatía isquémica conocida y cirugía vascular mayor.
 - Enfermedad coronaria detectada en la valoración preoperatoria y cirugía vascular mayor.
- **Es razonable administrarlos:**
 - Enfermedad coronaria conocida o detectada en el preoperatorio y cirugía abdominal o intratorácica.
- **Se debe considerar su administración:**
 - Pacientes con 2 o más factores clínicos de riesgo y cirugía de alto riesgo (incluye intratorácica e intraperitoneal).
- **No están indicados:**
 - Bajo riesgo cardíaco y cirugía.
- **Situaciones en las que es controvertido recomendarlos:**
 - Riesgo cardíaco intermedio
 - 1 factor clínico de riesgo o 2 predictores menores de riesgo.
 - 2 factores clínicos de riesgo + cirugía que no es vascular ni intratorácica ni intraabdominal mayor.
 - Bajo riesgo y cirugía
- **Contraindicaciones:**
 - Asma bronquial, hipotensión y/o bradicardia sintomática, bloqueo A-V avanzado, insuficiencia cardíaca descompensada severa.

Estatinas

Recommendations on statins		
Recommendations	Class ^a	Level ^b
It is recommended that statins be started in high-risk surgery patients, optimally between 30 days and at least 1 week before surgery	I	B
It is recommended that statins be continued perioperatively	I	C

^aClass of recommendation.
^bLevel of evidence.

- Cirugía vascular independientemente de la presencia de factores predictores de riesgo.
- Es caso de cirugía de riesgo intermedio y 1 solo factor clínico de riesgo, puede considerarse su administración.

Nitritos

Recommendations on nitrates

Recommendations	Class ^a	Level ^b
Perioperative nitroglycerin use for the prevention of adverse ischaemic events may be considered	IIb	B

^aClass of recommendation.

^bLevel of evidence.

IECAS

Recommendations on ACE inhibitor use

Recommendations	Class ^a	Level ^b
It is recommended that ACE inhibitors be continued during non-cardiac surgery in stable patients with LV systolic dysfunction.	I	C
ACE inhibitors are recommended in cardiac-stable patients with LV systolic dysfunction scheduled for high-risk surgery	I	C
ACE inhibitors should be considered in cardiac-stable patients with LV systolic dysfunction scheduled for low-/intermediate-risk surgery	IIa	C
Transient discontinuation of ACE inhibitors before non-cardiac surgery in hypertensive patients should be considered.	IIa	C

^aClass of recommendation.

^bLevel of evidence.

ACE = angiotensin-converting enzyme; LV = left ventricular.

Antagonistas del calcio

Recommendations on calcium channel blockers

Recommendations	Class ^a	Level ^b
It is recommended that calcium channel blockers be continued during non-cardiac surgery in patients with Prinzmetal angina pectoris	I	C
Heart rate-reducing calcium channel blockers, in particular diltiazem, may be considered before non-cardiac surgery in patients who have contra-indications to β -blockers	IIb	C
Routine use of calcium channel blockers to reduce the risk of perioperative cardiovascular complications is not recommended	III	C

^aClass of recommendation.

^bLevel of evidence.

Diuréticos

Recommendations on diuretics

Recommendations	Class ^a	Level ^b
It is recommended that electrolyte disturbances be corrected before surgery	I	B
It is recommended that hypertensive patients discontinue low-dose diuretics on the day of surgery and resume orally when possible	I	C
It is recommended that diuretics be continued in heart failure patients up to the day of surgery, resumed intravenously perioperatively, and continued orally when possible	I	C

^aClass of recommendation.

^bLevel of evidence.

Aspirina

Recommendations on aspirin

Recommendations	Class ^a	Level ^b
Continuation of aspirin in patients previously treated with aspirin should be considered in the perioperative period	Ia	B
Discontinuation of aspirin therapy in patients previously treated with aspirin should be considered only in those in whom haemostasis is difficult to control during surgery	Ia	B

^aClass of recommendation.

^bLevel of evidence.

Pacientes asintomáticos con revascularización coronaria previa a la cirugía

Recommendations on timing of non-cardiac surgery in cardiac-stable/asymptomatic patients with prior revascularization

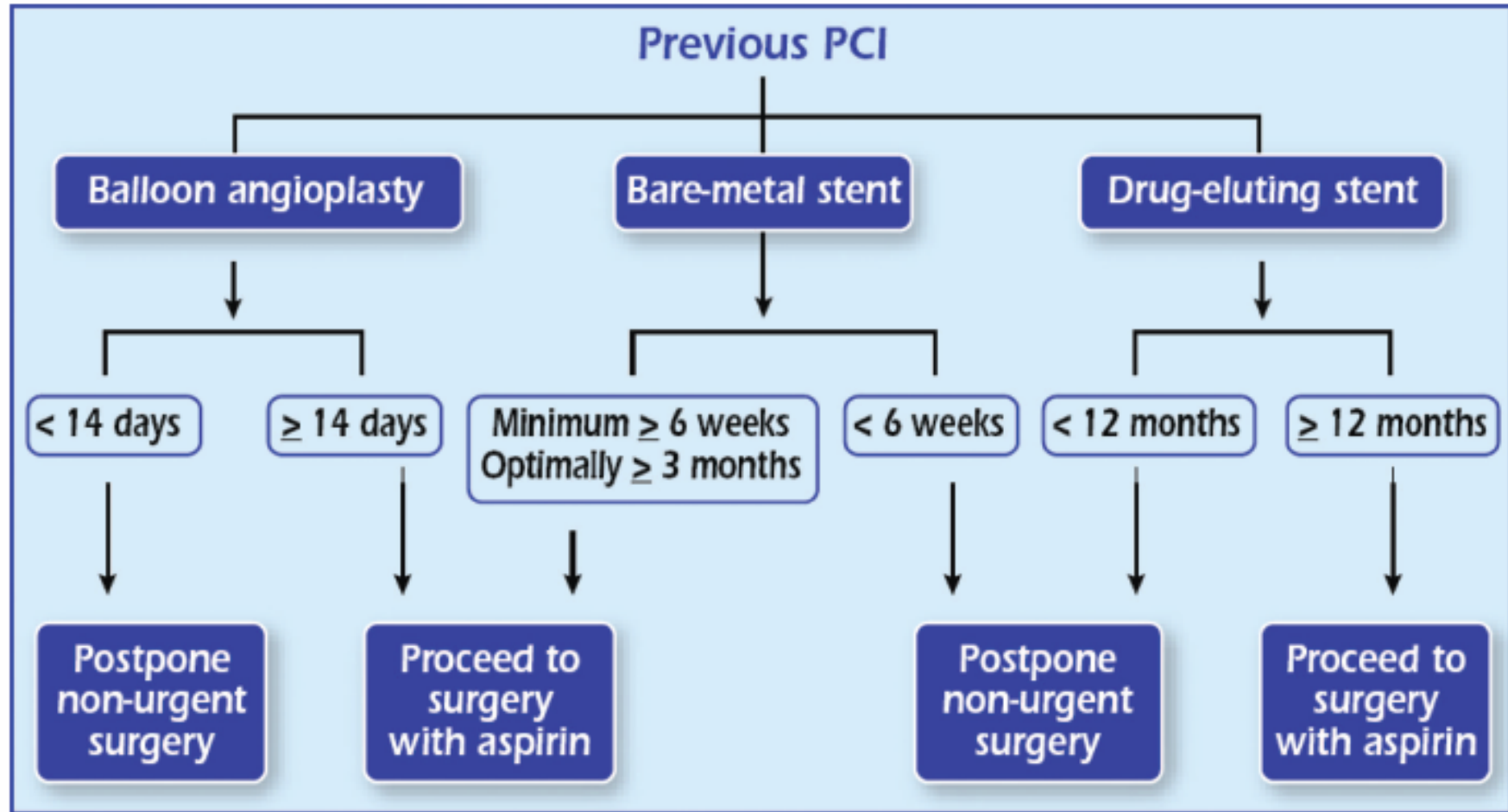
Recommendations	Class ^a	Level ^b
It is recommended that patients with previous CABG in the last 5 years be sent for non-cardiac surgery without further delay	I	C
It is recommended that non-cardiac surgery be performed in patients with recent bare metal stent implantation after a minimum 6 weeks and optimally 3 months following the intervention	I	B
It is recommended that non-cardiac surgery be performed in patients with recent drug-eluting stent implantation no sooner than 12 months following the intervention	I	B
Consideration should be given to postponing non-cardiac surgery in patients with recent balloon angioplasty until at least 2 weeks following the intervention	IIa	B

^aClass of recommendation.

^bLevel of evidence.

CABG = coronary artery bypass grafting.

Intervención coronaria percutánea



Predictores menores de riesgo:*

- Edad avanzada (>70 a).
- ECG anormal (HVI, bloqueo de rama izquierda, anomalías del ST-T).
- Arritmia no sinusal.
- HTA no controlada.

* La presencia simultánea de varios predictores menores de riesgo puede hacer sospechar de enfermedad coronaria, aunque no se han demostrado ser predictores de riesgo independientes de complicaciones perioperatorias.

Table 1 | Summary of pre-operative cardiac risk evaluation and perioperative management

Step	Urgency	Cardiac condition	Type of surgery ^a	Functional capacity	Number of clinical risk factors ^b	LV echo	ECG	Stress Testing ^c	β-Blockers ^d	ACE-inhibitors ^{d/e}	Aspirin ^d	Statins ^d	Coronary Revascularisation ^f
1	Urgent surgery					III C	IIa C	III C	I C	I C	I C	I C	III C
2	Elective surgery	Unstable				I C	I C	III C					I C
3	Elective surgery	Stable	Low risk (< 1%)		None	III B	III B	III C	III B	IIa C	IIb C	IIa B	III C
					≥ 1	III B	IIa B	III C	IIb B (titration) III A (no titration)	IIa C	IIb C	IIa B	III C
4				Excellent or good		III B	IIa B	III C	IIb B (titration) III A (no titration)	IIa C	IIb C	IIa B	III C
5	Elective surgery		Intermediate risk (1 - 5%)	Moderate or poor	None	III B	IIb B	IIb C	IIa B (titration) III A (no titration)	I C	IIb C	IIa B	III B
					≥ 1	III B	I B	IIb C	IIa B (titration) III A (no titration)	I C	IIb C	IIa B	III B
6	Elective surgery		High risk (> 5%)	Moderate or poor	≤ 2	IIa C	I B	IIb B	I B (titration) III A (no titration)	I C	IIb C	I B	IIb B
					≥ 3	IIa C	I B	I C	I B (titration) III A (no titration)	I C	IIb C	I B	IIb B

^aType of surgery (Table 4): risk of MI and cardiac death within 30 days after surgery.

^bRisk factors (Table 13): angina pectoris, MI, heart failure, stroke/transient ischaemic attack, renal dysfunction (creatinine > 170 µmol/L or 2 mg/dL or a creatine clearance of < 60 mL/min), diabetes mellitus.

^cNon-invasive testing not only for revascularization but also for patient counselling, change of perioperative management in relation to type of surgery, and anaesthesia technique.

^dInitiation of medical therapy, but in case of emergency surgery continuation of current medical therapy. Aspirin should be continued after stent replacement.

^eIn the presence of LV dysfunction (ejection fraction > 40%).

^fClass I recommendations for revascularization are consistent with the 2004 ACC/AHA guidelines: 1 = stable angina and significant left main disease; 2 = stable angina and three-vessel disease, especially when LV ejection fraction is < 50%; 3 = stable angina and two-vessel disease with significant proximal left anterior descending coronary artery stenosis and either LV ejection fraction < 50% or demonstrable ischaemia on non-invasive testing; 4 = high-risk unstable angina or non-STEMI; 5 = acute STEMI.

Referencias

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