Universidad Centroccidental Lisandro Alvarado
Decanato de Ciencias de la Salud
Postgrado de Cardiología Clínica

MEDICINA BASADA EN LA EVIDENCIA
ANTICOAGULACIÓN EN PATOLOGÍA VALVULAR

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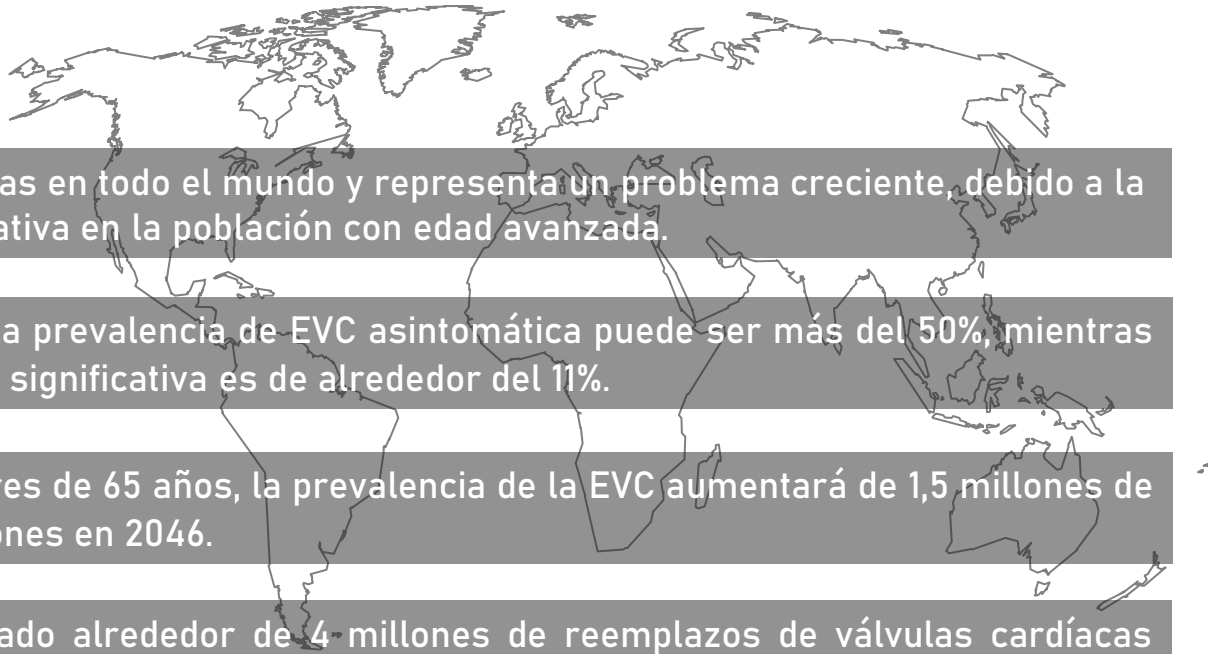
Coordinadora: Dra. Yris Flores

Barquisimeto, Marzo 2022

Epidemiología



La EVC afecta a 100 millones de personas en todo el mundo y representa un problema creciente, debido a la carga de enfermedad valvular degenerativa en la población con edad avanzada.

Entre las personas de 65 años o más, la prevalencia de EVC asintomática puede ser más del 50%, mientras que la prevalencia de EVC clínicamente significativa es de alrededor del 11%.

Se prevé que, para las personas mayores de 65 años, la prevalencia de la EVC aumentará de 1,5 millones de personas actualmente a más de 3 millones en 2046.

En los últimos 50 años se han realizado alrededor de 4 millones de reemplazos de válvulas cardíacas protésica.

Pronostico: número total de reemplazos será de 850.000 al año para 2050.

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Válvulas

Biológicas

Tejidos valvulares finos, constituidas por valvas oclusoras flexibles de origen animal o humano.

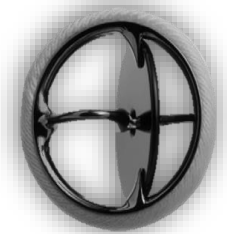
Soporte

Sin soporte

Percutánea

Mecánicas

Oclusores rígidos, fabricación con material no biológico (polímeros de silicone, titanio, carbón pirolítico).



Disco único oscilante

Doble disco

Jaula-bola

Recommendations for evaluation of prosthetic valves with echocardiography and doppler ultrasound. *J Am Soc Echocardiogr*;22 (9):975-1014

Anticoagulantes

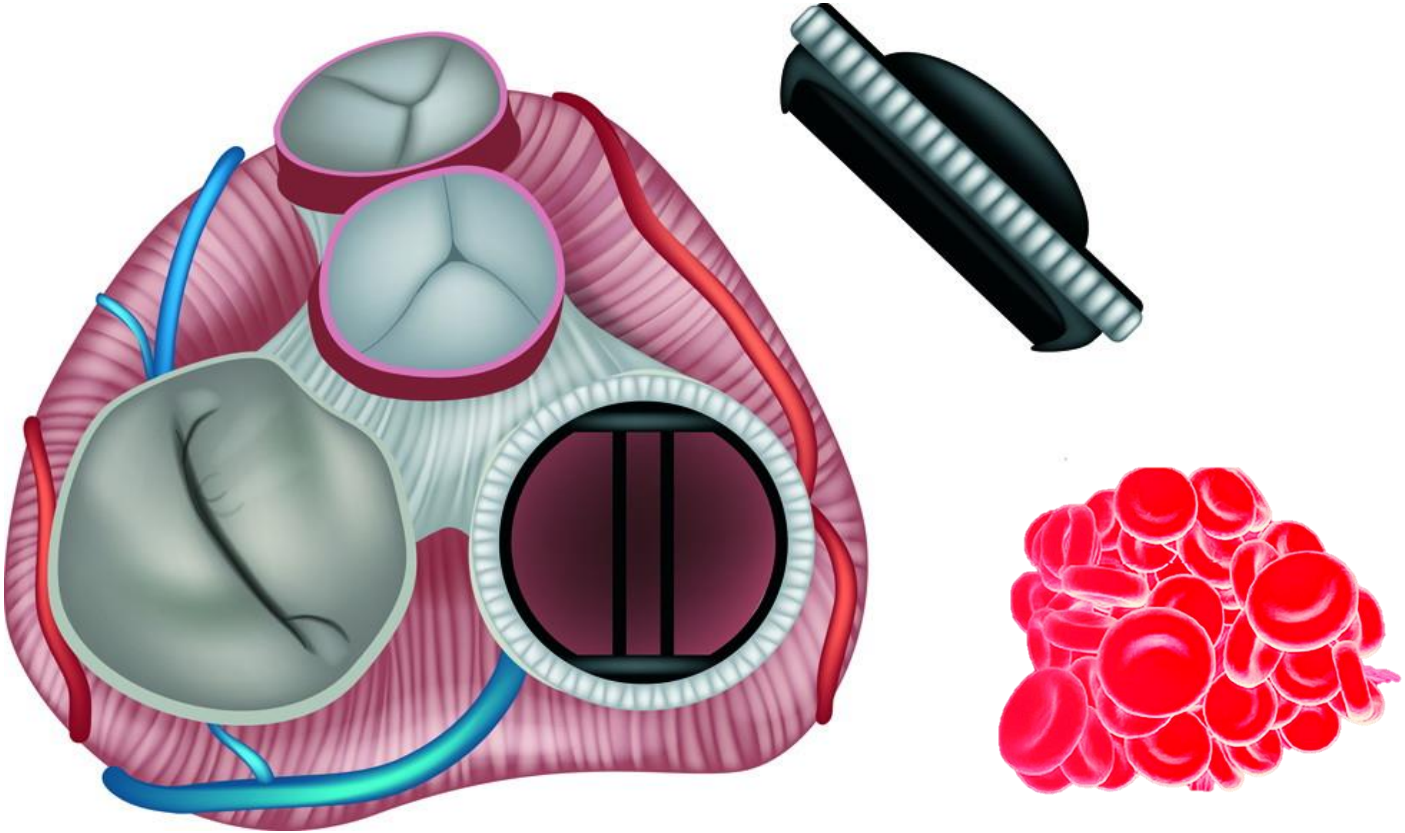
Inhibidores Directo del Factor Xa

-Rivaroxabán
-Apixabán
-Edoxabán

Antagonistas de la vitamina K

-Warfarina
-Acenocumarol

Nuevos anticoagulantes orales y su papel en la práctica clínica, DOI: 10.1016/S1131-3587(13)70057-8



ANTICOAGULACIÓN EN PRÓTESIS BIOLÓGICAS Y MECÁNICAS

ESC European Society of Cardiology
European Heart Journal (2017) 38, 2739–2791
doi:10.1093/eurheartj/ehx391

ESC/EACTS GUIDELINES

2017 ESC/EACTS Guidelines for the management of valvular heart disease

The Task Force for the Management of Valvular Heart Disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

NICE National Institute for Health and Care Excellence

Royal College of Physicians

NICE guideline

Heart valve disease presenting in adults: investigation and management

Editorial

Comentarios a la guía ESC/EACTS 2017 sobre el tratamiento de las valvulopatías

CrossMark

Comments on the 2017 ESC/EACTS Guidelines on the Management of Valvular Heart Disease

Grupo de Trabajo de la SEC para la guía ESC/EACTS 2017 sobre valvulopatías, revisores expertos para la guía ESC/EACTS 2017 sobre valvulopatías y Comité de Guías de la SEC[*,◊]

ESC European Society of Cardiology
European Heart Journal (2022) 43, 561–632
https://doi.org/10.1093/eurheartj/ehab395

ESC/EACTS GUIDELINES

2021 ESC/EACTS Guidelines for the management of valvular heart disease

Developed by the Task Force for the management of valvular heart disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

Circulation

ACC/AHA CLINICAL PRACTICE GUIDELINE

2020 ACC/AHA Guideline for the Management of Patients With Valvular Heart Disease

A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines

Editorial

Comentarios a la guía ESC/EACTS 2021 sobre el diagnóstico y tratamiento de las valvulopatías

Comments on the 2021 ESC/EACTS guidelines for the management of valvular heart disease

J. Bermejo[*], P. Avanzas[*] y Grupo de Trabajo de la SEC para la guía ESC/EACTS 2021 sobre el diagnóstico y tratamiento de las valvulopatías y Comité de Guías de la SEC[◊]

ESC European Society of Cardiology
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Classes of recommendations	Definition	Suggested wording to use
Class I	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective.	Is recommended/is indicated
Class II	Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure.	
Class IIa	*Weight of evidence/opinion is in favour of usefulness/efficacy.*	Should be considered
Class IIb	*Usefulness/efficacy is less well established by evidence/opinion.*	May be considered
Class III	Evidence or general agreement that the given treatment or procedure is not useful/effective; and in some cases may be harmful.	Is not recommended

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Table 2 Levels of evidence

Level of evidence A	Data derived from multiple randomized clinical trials or meta-analyses.
Level of evidence B	Data derived from a single randomized clinical trial or large non-randomized studies.
Level of evidence C	Consensus of opinion of the experts and/or small studies, retrospective studies, registries.

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Management of atrial fibrillation in patients with VHD

Recommendations	Class[a]	Level[b]
Anticoagulation		
NOACs should be considered as an alternative to VKAs in patients with aortic stenosis, aortic regurgitation and mitral regurgitation presenting with atrial fibrillation.[38–41]	IIa	B
NOACs should be considered as an alternative to VKAs after the third month of implantation in patients who have atrial fibrillation associated with a surgical or transcatheter aortic valve bioprosthesis.	IIa	C
The use of NOACs is not recommended in patients with atrial fibrillation and moderate to severe mitral stenosis.	III	C
NOACS are contraindicated in patients with a mechanical valve.[45]	III	B

2017 ESC/EACTS Guidelines for the management of valvular heart disease. European Heart Journal (2017) 38, 2739–2791

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Clase IIa: el peso de la evidencia/opinión esta a favor de la utilidad/eficacia. Debería ser considerado.	Nivel de evidencia B: datos derivados de un único ensayo clínico aleatorizado o grandes estudios no aleatorizados.
Clase IIa: el peso de la evidencia/opinión esta a favor de la utilidad/eficacia. Debería ser considerado.	Nivel de evidencia C: consenso de opinión de los expertos y/o pequeños estudios, estudios retrospectivos, registros
Clase III: evidencia o acuerdo general de que el tratamiento o procedimiento dado no es útil/efectivo y en algunos casos puede ser perjudicial. No es recomendado.	Nivel de evidencia B: datos derivados de un único ensayo clínico aleatorizado o grandes estudios no aleatorizados.

Management of atrial fibrillation in patients with VHD

Recommendations	Class[a]	Level[b]
Anticoagulation		
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The use of NOACs is not recommended in patients with atrial fibrillation and moderate to severe mitral stenosis.	III	C
NOACS are contraindicated in patients with a mechanical valve.[45]	III	B

Los NOAC deben considerarse como una alternativa a los AVK en pacientes con estenosis aórtica, insuficiencia aórtica e insuficiencia mitral que presentan FA.

Los NACO deben considerarse como una alternativa a los AVK después del tercer mes del implante en pacientes con FA asociada a una bioprótesis de válvula aórtica quirúrgica o transcatéter.

Los NOACS están contraindicados en pacientes con válvula mecánica.

2017 ESC/EACTS Guidelines for the management of valvular heart disease. European Heart Journal (2017) 38, 2739–2791

Editorial

Comentarios a la guía ESC/EACTS 2017 sobre el tratamiento de las valvulopatías

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Grupo de Trabajo de la SEC para la guía ESC/EACTS 2017 sobre valvulopatías, revisores expertos para la guía ESC/EACTS 2017 sobre valvulopatías y Comité de Guías de la SEC[*,§]*

Recomendaciones

El tratamiento antitrombótico los primeros 3-6 meses después del TAVI está poco definido.

Para los pacientes con FA, esta guía introduce la posibilidad de usar anticoagulantes de acción directa 3 meses después de la intervención para los portadores de bioprótesis y en pacientes con valvulopatías nativas, salvo la estenosis mitral moderada o grave *(indicación IIa, evidencia C).*

Clase IIa: el peso de la evidencia/opinión esta a favor de la utilidad/eficacia. Debería ser considerado.	Nivel de evidencia C: consenso de opinión de los expertos y/o pequeños estudios, estudios retrospectivos, registros

2017 ESC/EACTS Guidelines for the management of valvular heart disease. European Heart Journal (2017) 38, 2739–2791

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CLASS (STRENGTH) OF RECOMMENDATION

CLASS 1 (STRONG) — **Benefit >>> Risk**

Suggested phrases for writing recommendations:
- Is recommended
- Is indicated/useful/effective/beneficial
- Should be performed/administered/other
- Comparative-Effectiveness Phrases†:
  - Treatment/strategy A is recommended/indicated in preference to treatment B
  - Treatment A should be chosen over treatment B

CLASS 2a (MODERATE) — **Benefit >> Risk**

Suggested phrases for writing recommendations:
- Is reasonable
- Can be useful/effective/beneficial
- Comparative-Effectiveness Phrases†:
  - Treatment/strategy A is probably recommended/indicated in preference to treatment B
  - It is reasonable to choose treatment A over treatment B

CLASS 2b (WEAK) — **Benefit ≥ Risk**

Suggested phrases for writing recommendations:
- May/might be reasonable
- May/might be considered
- Usefulness/effectiveness is unknown/unclear/uncertain or not well-established

CLASS 3: No Benefit (MODERATE) — **Benefit = Risk**
(Generally, LOE A or B use only)

Suggested phrases for writing recommendations:
- Is not recommended
- Is not indicated/useful/effective/beneficial
- Should not be performed/administered/other

Class 3: Harm (STRONG) — **Risk > Benefit**

Suggested phrases for writing recommendations:
- Potentially harmful
- Causes harm
- Associated with excess morbidity/mortality
- Should not be performed/administered/other

LEVEL (QUALITY) OF EVIDENCE‡

LEVEL A
- High-quality evidence‡ from more than 1 RCT
- Meta-analyses of high-quality RCTs
- One or more RCTs corroborated by high-quality registry studies

LEVEL B-R — **(Randomized)**
- Moderate-quality evidence‡ from 1 or more RCTs
- Meta-analyses of moderate-quality RCTs

LEVEL B-NR — **(Nonrandomized)**
- Moderate-quality evidence‡ from 1 or more well-designed, well-executed nonrandomized studies, observational studies, or registry studies
- Meta-analyses of such studies

LEVEL C-LD — **(Limited Data)**
- Randomized or nonrandomized observational or registry studies with limitations of design or execution
- Meta-analyses of such studies
- Physiological or mechanistic studies in human subjects

LEVEL C-EO — **(Expert Opinion)**
- Consensus of expert opinion based on clinical experience

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Clase 1: (Fuerte) Beneficio riesgo Se recomienda, beneficioso, efectivo	Nivel A: Evidencia de alta calidad
Clase 1: (Fuerte) Beneficio riesgo Se recomienda, beneficioso, efectivo	Nivel C-EO: Opinión experta Conceso de opinión de expertos basado en la experiencia clínica

2.4.3. Anticoagulation for AF in Patients With VHD

Recommendations for Anticoagulation for AF in Patients With VHD

Referenced studies that support the recommendations are summarized in Online Data Supplement 2.

COR	LOE	Recommendations
1	A	1. For patients with AF and native valve heart disease (except rheumatic mitral stenosis [MS]) or who received a bioprosthetic valve >3 months ago, a non–vitamin K oral anticoagulant (NOAC) is an effective alternative to VKA anticoagulation and should be administered on the basis of the patient's CHA_2DS_2-VASc score.[1,2]
1	C-EO	2. For patients with AF and rheumatic MS, long-term VKA oral anticoagulation is recommended.
2a	B-NR	3. For patients with new-onset AF ≤3 months after surgical or transcatheter bioprosthetic valve replacement, anticoagulation with a VKA is reasonable.[3-6]
3: Harm	B-R	4. In patients with mechanical heart valves with or without AF who require long-term anticoagulation with VKA to prevent valve thrombosis, NOACs are not recommended.[7]

1. Para los pacientes con FA y cardiopatía valvular nativa (excepto estenosis mitral [EM] reumática) o que recibieron una válvula bioprotésica hace más de 3 meses, un NOAC es una alternativa eficaz a la anticoagulación AVK y debe administrarse sobre la base de la puntuación CHA2DS2-VASc del paciente.

2. Para pacientes con FA y EM reumática, se recomienda la anticoagulación oral con AVK a largo plazo.

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2a	B-NR	3. For patients with new-onset AF ≤3 months after surgical or transcatheter bioprosthetic valve replacement, anticoagulation with a VKA is reasonable.[3-6]
3: Harm	B-R	4. In patients with mechanical heart valves with or without AF who require long-term anticoagulation with VKA to prevent valve thrombosis, NOACs are not recommended.[7]

3. Para los pacientes con FA de inicio reciente ≤3 meses después del reemplazo valvular bioprotésico quirúrgico o transcatéter, es razonable la anticoagulación con un AVK.

4. En pacientes con válvulas cardíacas mecánicas con o sin FA que requieren anticoagulación a largo plazo con AVK para prevenir la trombosis de la válvula, no se recomiendan los NACO.

Clase 2 a: (Moderada) Beneficio »riesgo. Es razonable, útil, efectivo	Nivel B-NR: No aleatorizado Evidencia de calidad moderada
Clase 3: (Daño fuerte) Potencialmente peligroso	Nivel B-R: Aleatorizado Evidencia de calidad moderada

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11.2. Antithrombotic Therapy

Recommendations for Antithrombotic Therapy for Prosthetic Valves

Referenced studies that support the recommendations are summarized in Online Data Supplement 36.

COR	LOE	Recommendations
1	A	1. In patients with a mechanical prosthetic valve, anticoagulation with a VKA is recommended.[1–5]
1	B-NR	2. For patients with a mechanical bileaflet or current-generation single-tilting disk AVR and no risk factors for thromboembolism, anticoagulation with a VKA to achieve an INR of 2.5 is recommended.[6–8]
1	B-NR	3. For patients with a mechanical AVR and additional risk factors for thromboembolism (eg, AF, previous thromboembolism, LV dysfunction, hypercoagulable state) or an older-generation prosthesis (eg, ball-in-cage), anticoagulation with a VKA is indicated to achieve an INR of 3.0.[9,10]

Recommendations for Antithrombotic Therapy for Prosthetic Valves (Continued)

COR	LOE	Recommendations
1	B-NR	4. For patients with a mechanical mitral valve replacement, anticoagulation with a VKA is indicated to achieve an INR of 3.0.[9,11]
2a	B-R	5. For patients with a bioprosthetic TAVI, aspirin 75 to 100 mg daily is reasonable in the absence of other indications for oral anticoagulants.[12–14]
2a	B-NR	6. For all patients with a bioprosthetic SAVR or mitral valve replacement, aspirin 75 to 100 mg daily is reasonable in the absence of other indications for oral anticoagulants.[9,15–18]
2a	B-NR	7. For patients with a bioprosthetic SAVR or mitral valve replacement who are at low risk of bleeding, anticoagulation with a VKA to achieve an INR of 2.5 is reasonable for at least 3 months and for as long as 6 months after surgical replacement.[15,19–25]
2b	B-R	8. For patients with a mechanical SAVR or mitral valve replacement who are managed with a VKA and have an indication for antiplatelet therapy, addition of aspirin 75 to 100 mg daily may be considered when the risk of bleeding is low.[26]
2b	B-R	9. For patients with a mechanical On-X AVR and no thromboembolic risk factors, use of a VKA targeted to a lower INR (1.5–2.0) may be reasonable starting ≥3 months after surgery, with continuation of aspirin 75 to 100 mg daily.[27,28]
2b	B-NR	10. For patients with a bioprosthetic TAVI who are at low risk of bleeding, dual-antiplatelet therapy with aspirin 75 to 100 mg and clopidogrel 75 mg may be reasonable for 3 to 6 months after valve implantation.[12,13,29]
2b	B-NR	11. For patients with a bioprosthetic TAVI who are at low risk of bleeding, anticoagulation with a VKA to achieve an INR of 2.5 may be reasonable for at least 3 months after valve implantation.[23,31–33]
3: Harm	B-R	12. For patients with bioprosthetic TAVI, treatment with low-dose rivaroxaban (10 mg daily) plus aspirin (75–100 mg) is contraindicated in the absence of other indications for oral anticoagulants.[30]
3: Harm	B-R	13. For patients with a mechanical valve prosthesis, anticoagulation with the direct thrombin inhibitor, dabigatran, is contraindicated.[4,5]
3: Harm	C-EO	14. For patients with a mechanical valve prosthesis, the use of anti-Xa direct oral anticoagulants has not been assessed and is not recommended.[34–37]

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Clase 1: (Fuerte) Beneficio riesgo Se recomienda, beneficioso, efectivo	Nivel A: Evidencia de alta calidad
Clase 1: (Fuerte) Beneficio riesgo Se recomienda, beneficioso, efectivo	Nivel B-NR: No aleatorizado Evidencia de calidad moderada

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Recommendations for Antithrombotic Therapy for Prosthetic Valves (Continued)

COR	LOE	Recommendations
1	B-NR	4. For patients with a mechanical mitral valve replacement, anticoagulation with a VKA is indicated to achieve an INR of 3.0.[9,11]
2a	B-R	5. For patients with a bioprosthetic TAVI, aspirin 75 to 100 mg daily is reasonable in the absence of other indications for oral anticoagulants.[12–14]
2a	B-NR	6. For all patients with a bioprosthetic SAVR or mitral valve replacement, aspirin 75 to 100 mg daily is reasonable in the absence of other indications for oral anticoagulants.[9,15–18]
2a	B-NR	7. For patients with a bioprosthetic SAVR or mitral valve replacement who are at low risk of bleeding, anticoagulation with a VKA to achieve an INR of 2.5 is reasonable for at least 3 months and for as long as 6 months after surgical replacement.[15,19–25]

1. En pacientes con prótesis valvular mecánica se recomienda la anticoagulación con un AVK.

2. Para los pacientes con AVR bivalva mecánica o disco basculante único de generación actual y sin factores de riesgo de tromboembolismo, se recomienda la anticoagulación con un AVK para lograr un INR de 2,5.

3. Para pacientes con AVR mecánico y factores de riesgo adicionales de tromboembolismo o una prótesis de generación anterior, está indicada la anticoagulación con un AVK para lograr un INR de 3.0.

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2b	B-R	8. For patients with a mechanical SAVR or mitral valve replacement who are managed with a VKA and have an indication for antiplatelet therapy, addition of aspirin 75 to 100 mg daily may be considered when the risk of bleeding is low.[26]
2b	B-R	9. For patients with a mechanical On-X AVR and no thromboembolic risk factors, use of a VKA targeted to a lower INR (1.5–2.0) may be reasonable starting ≥3 months after surgery, with continuation of aspirin 75 to 100 mg daily.[27,28]
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Clase 3: (Daño fuerte) Potencialmente peligroso	Nivel C-EO: Opinión experta Conceso de opinión de expertos basado en la experiencia clínica

14. Para pacientes con prótesis valvular mecánica, no se ha evaluado y no se recomienda el uso de anticoagulantes orales directos anti-Xa.

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Clase 1: (Fuerte) Beneficio riesgo Se recomienda, beneficioso, efectivo	Clase 2 a: (Moderada) Beneficio »riesgo. Es razonable, útil, efectivo

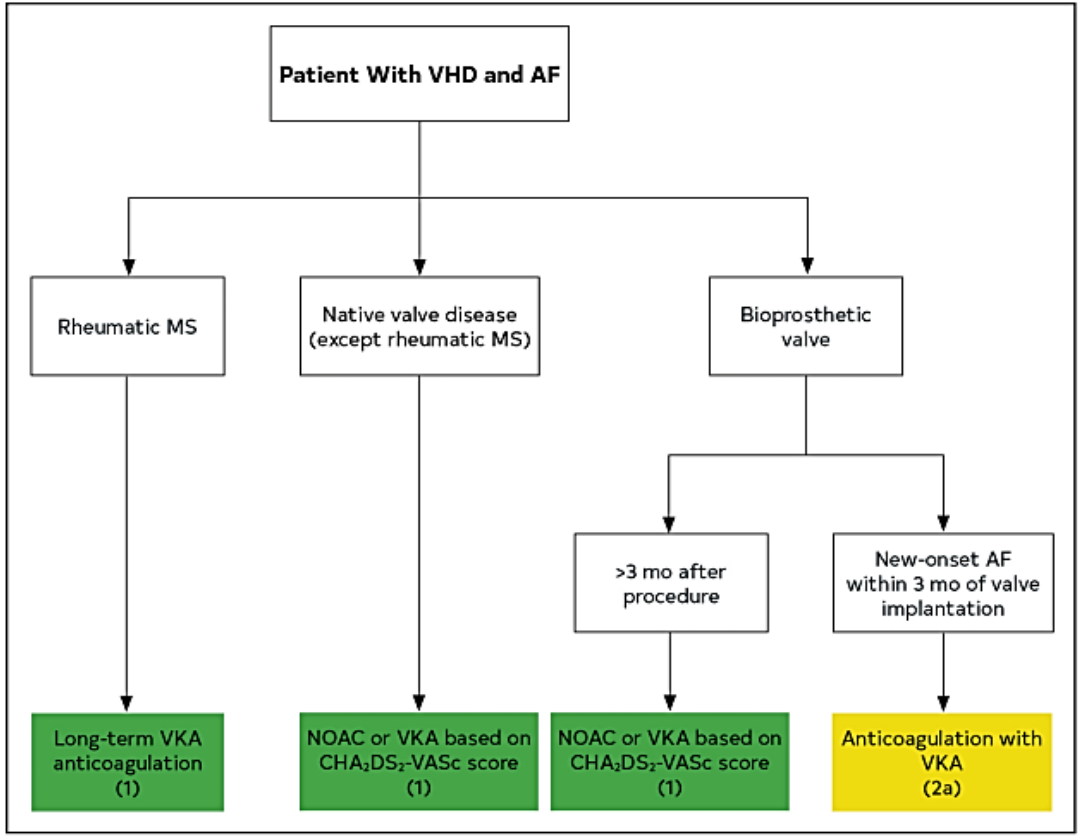

Figure 1. Anticoagulation for AF in Patients With VHD.
Colors correspond to Table 2. AF indicates atrial fibrillation; MS, mitral stenosis; NOAC, non–vitamin K oral anticoagulant; VHD, valvular heart disease; and VKA, vitamin K antagonist.

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NICE National Institute for Health and Care Excellence

Royal College of Physicians

NICE guideline

Heart valve disease presenting in adults: investigation and management

Anticoagulation and antiplatelet therapy

Recommendations 1.7.1 to 1.7.3

Why the committee made the recommendations

Anticoagulant and antiplatelet treatment after surgical biological valve replacement

En pacientes sin fibrilación auricular, se demostró que se presenta un mayor riesgo de hemorragia con la administración de antagonistas de la vitamina K, en comparación con la terapia antiplaquetaria única (aspirina).

No se observó una reducción clara en la mortalidad o los eventos tromboembólicos con el antagonista de la vitamina K.

El comité acordó que la anticoagulación (AVK o DOAC) no debe ofrecerse después del reemplazo quirúrgico de la válvula biológica, a menos que existan otras indicaciones para la anticoagulación. No hubo evidencia que demostrará que los DOAC son seguros.

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NICE National Institute for Health and Care Excellence

Royal College of Physicians

NICE guideline

Heart valve disease presenting in adults: investigation and management

Anticoagulation and antiplatelet therapy

Recommendations 1.7.1 to 1.7.3

Why the committee made the recommendations

Anticoagulant and antiplatelet treatment after surgical biological valve replacement

Tratamiento anticoagulante y antiplaquetario tras recambio valvular biológico

Actualmente, la práctica es variable, y algunos centros ofrecen antagonistas de la vitamina K después del reemplazo quirúrgico de la válvula biológica. Por tanto, la recomendación supondrá un cambio en la práctica de algunos centros.

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ESC European Society of Cardiology
European Heart Journal (2022) 43, 561–632
https://doi.org/10.1093/eurheartj/ehab395
ESC/EACTS GUIDELINES

2021 ESC/EACTS Guidelines for the management of valvular heart disease

Developed by the Task Force for the management of valvular heart disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

Editorial

Comentarios a la guía ESC/EACTS 2021 sobre el diagnóstico y tratamiento de las valvulopatías

Comments on the 2021 ESC/EACTS guidelines for the management of valvular heart disease

J. Bermejo*, P. Avanzas* y Grupo de Trabajo de la SEC para la guía ESC/EACTS 2021 sobre el diagnóstico y tratamiento de las valvulopatías y Comité de Guías de la SEC◊

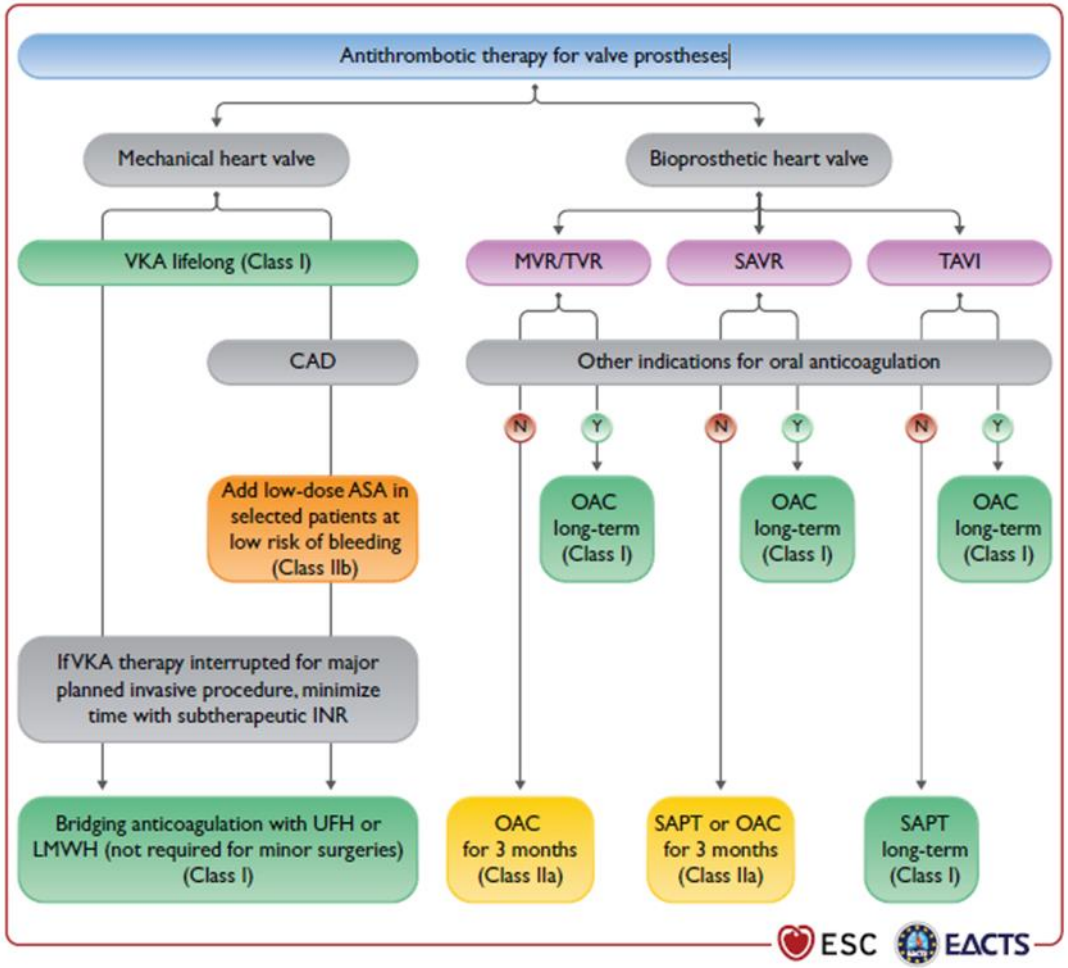
Papel de los anticoagulantes orales de acción directa

La guía recomienda los anticoagulantes orales de acción directa (ACOD) para los pacientes portadores de prótesis biológicas y en FA a partir de los 3 meses del implante valvular.

Clase IIb:	Nivel de evidencia C:
la utilidad/eficacia es menor, establecido por evidencia/opinión. Puede ser considerado.	consenso de opinión de los expertos y/o pequeños estudios, estudios retrospectivos, registros.

- Se puede considerar los ACOD durante los primeros 3 meses tras el implante quirúrgico de una bioprótesis mitral en pacientes con y sin FA, pero la recomendación es de *clase IIb y el nivel de evidencia C.*
- Para los pacientes portadores de prótesis mecánica se mantiene la indicación de tratamiento con AVK.

2021 ESC/EACTS Guidelines for the management of valvular heart disease. European Heart Journal (2022) 43, 561–632



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Clase I:
Evidencia y/o acuerdo general que un tratamiento dado o procedimiento es beneficioso, útil, eficaz.

Es recomendable indicarlo.

Clase IIa:
el peso de la evidencia/opinión esta a favor de la utilidad/eficacia.

Debería ser considerado.

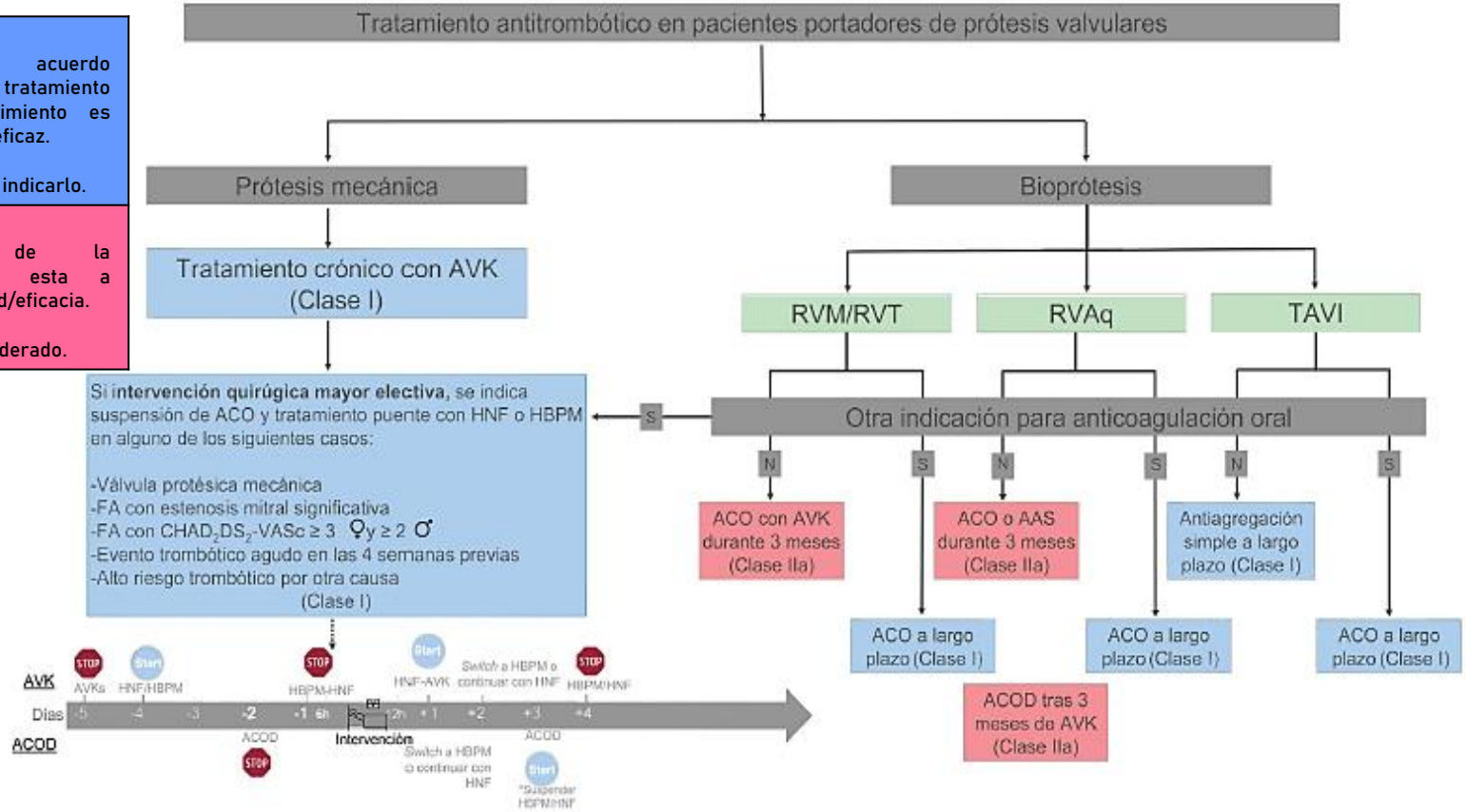

Figura 1. Anticoagulación para pacientes portadores de prótesis valvulares quirúrgicas y percutáneas. AAS: ácido acetilsalicílico; ACO: anticoagulación oral; ACOD: anticoagulantes orales de acción directa; AVK: antagonistas de la vitamina K; HBPM: heparina de bajo peso molecular; HNF: heparina no fraccionada; RQVA: recambio quirúrgico de válvula aórtica; RVM: recambio o reparación de válvula mitral; RVT: recambio o reparación de válvula tricúspide; TAVI: implante percutáneo de válvula aórtica.

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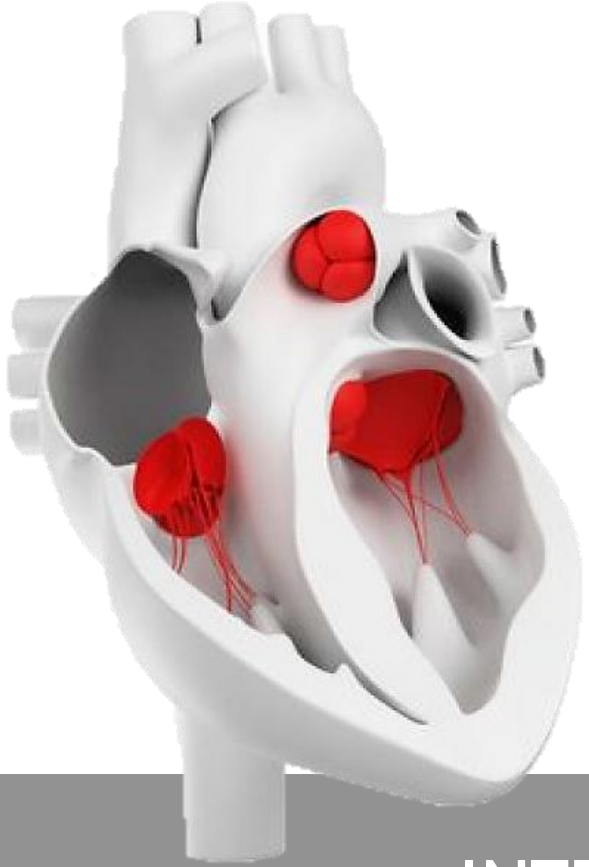

INTERROGANTE II CICLO
ANTICOAGULACIÓN EN PRÓTESIS VALVULARES

Interrogante

En pacientes portadores de prótesis valvulares (biológica o mecánica) ***¿la administración de Inhibidores Directo del Factor Xa reduce la presencia de eventos trombóticos, en comparación con los Antagonistas de la vitamina K?***

Artículos

01

ORIGINAL RESEARCH ARTICLE

Check for updates

Rivaroxaban Versus Warfarin in Patients with Mechanical Heart Valves: Open-Label, Proof-of-Concept trial—The RIWA study

Andre Rodrigues Duraes[1,2] · Yasmin de Souza Lima Bitar[2] · Igor Santos Schonhofen[3] · Kethyren Santos Oliveira Travassos[4] · Larissa Vitória Pereira[5] · Jose Admirço Lima Filho[3] · Mansueto Gomes Neto[1] · Roque Aras Junior[1,2] · Leonardo Roever[6]

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02

ORIGINAL ARTICLE

Rivaroxaban in Patients with Atrial Fibrillation and a Bioprosthetic Mitral Valve

H.P. Guimarães, R.D. Lopes, P.G.M. de Barros e Silva, I.L. Liporace, R.O. Sampaio, F. Tarasoutchi, C.R. Hoffmann-Filho, R. de Lemos Soares Patriota, T.L.L. Leiria, D. Lamprea, D.B. Precoma, F.A. Atik, F.S. Silveira, F.R. Farias, D.O. Barreto, A.P. Almeida, A.C. Zilli, J.D. de Souza Neto, M.A. Cavalcante, F.A.M.S. Figueira, F.C.S. Kojima, L. Damiani, R.H.N. Santos, N. Valeis, V.B. Campos, J.F.K. Saraiva, F.H. Fonseca, I.M. Pinto, C.C. Magalhães, J.F.M. Ferreira, J.H. Alexander, R. Pavanello, A.B. Cavalcanti, and O. Berwanger, for the RIVER Trial Investigators*

03

ORIGINAL RESEARCH

American Heart Association | American Stroke Association

Safety and Efficacy of Novel Oral Anticoagulants Versus Warfarin in Medicare Beneficiaries With Atrial Fibrillation and Valvular Heart Disease

Alexandros Briasoulis, MD, PhD; Chakradhari Inampudi, MD; Emmanuel Akintoye, MD, MPH; Paulino Alvarez, MD; Sidakpal Panaich, MD; Mary Vaughan-Sarrazin, PhD

04

ARTICLE IN PRESS

Clinical Therapeutics/Volume xxx, Number xxx, xxxx

Clinical Benefit of Direct Oral Anticoagulants Versus Vitamin K Antagonists in Patients with Atrial Fibrillation and Bioprosthetic Heart Valves

Vincenzo Russo, MD, PhD[1]; Andreina Carbone, MD[1]; Emilio Attena, MD[2]; Anna Rago, MD[1]; Carmine Mazzone, MD[3]; Riccardo Proietti, MD[4]; Valentina Parisi, MD[5]; Andrea Scotti, MD[4]; Gerardo Nigro, MD, Prof[1]; Paolo Golino, MD, Prof[1]; and Antonio D'Onofrio, MD[6]

05

Systematic Review and Meta-Analysis: Can We Compare Direct Oral Anticoagulants to Warfarin in Patients With Atrial Fibrillation and Bio-Prosthetic Valves?

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Muchas gracias.