Tests pharmacologiques en électrophysiologie cardiaque
Recommandations européennes 2025

Vincent PROBST, MD, PhD

Reference center for hereditary arrhythmic diseases

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Nantes, France

Inserm cnrs UNIVERSITÉ DE NANTES CENTRE HOSPITALIER UNIVERSITAIRE DE NANTES

European Reference Network
for rare or low prevalence complex diseases
Network Heart Diseases (ERN GUARD-HEART)

ESC European Society of Cardiology
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EHRA DOCUMENT
EHRA European Heart Rhythm Association

The diagnostic role of pharmacological provocation testing in cardiac electrophysiology: a clinical consensus statement of the European Heart Rhythm Association and the European Association of Percutaneous Cardiovascular Interventions (EAPCI) of the ESC, the ESC Working Group on Cardiovascular Pharmacotherapy, the Association of European Paediatric and Congenital Cardiology (AEPC), the Paediatric & Congenital Electrophysiology Society (PACES), the Heart Rhythm Society (HRS), the Asia Pacific Heart Rhythm Society (APHRS), and the Latin American Heart Rhythm Society (LAHRS)

Elijah R. Behr (Chair)[1,2,3]*, Bo Gregers Winkel [4,5]†, Bode Ensam [1,6]†, Alberto Alfie (LAHRS)[7], Elena Arbelo [5,8,9,10], Colin Berry (EAPCI)[11], Marina Cerrone (HRS)[12], Giulio Conte [13], Lia Crotti [14,15], Cecilia M. Gonzalez Corcia (PACES)[16], Juan Carlos Kaski (Cardio Pharma WG)[1], Koonlawee Nademanee (APHRS)[17], Pieter G. Postema [5,18], Silvia Priori [5,19,20], Vincent Probst [5,21], Georgia Sarquella-Brugada (AEPC)[5,22], Eric Schulze-Bahr [5,23], Rafik Tadros [24], Arthur Wilde [5,21], and Jacob Tfelt-Hansen (Co-Chair)[4,5,25]

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- Objectif : identifier des syndromes arythmogènes latents
- Tests majeurs : ajmaline (Brugada) & adrénaline (CPVT, LQTS)
- Nouveauté 2025 :
  - Précisions sur les conditions de réalisation
  - Meilleures définitions des indications

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Suspected Brugada syndrome (BrS) considered for SCB testing in the context of at least one of the following

- Cardiac arrest or syncope
- Family history of BrS
- Family history of sudden unexplained death
- Type 2/3 Brugada ECG pattern with other ECG features and/or one of the above

No → **Do not perform SCB test**

Yes ↓

Patient counselling of pros and cons before taking consent for SCB test

Advantages of performing SCB testing

- Excludes BrS in presence of a negative test, especially when using ajmaline
- Avoids diagnostic ambiguity
- Guides extended family screening
- Informs on safety of sodium channel blocker use in patients who require such drugs
- Informs of need for suppressing fever

Disadvantages of performing SCB testing

- Limited specificity (e.g. ajmaline) and sensitivity (e.g. procainamide)
- A positive test can generate anxiety and unnecessary interventions despite favourable prognosis in asymptomatic patients
- Potential negative impact on insurability
- Procedural risk especially for patients with a pathogenic *SCN5A* variant

Figure 5 A schema for supporting shared decision-making for SCB testing for suspected Brugada syndrome. SCB, sodium channel blocker.

When to perform SCB provocation	Strength of evidence
It is advised that all patients undergoing an SCB test are counselled about the advantages and disadvantages of testing, including the generally low lifetime risk of life-threatening arrhythmia if asymptomatic, and the possibility of a false positive or false negative result.	 >90% agree
An SCB test is advised for a patient with VF or polymorphic VT that remains unexplained following comprehensive clinical testing.	
An SCB provocation test is advised in an asymptomatic first-degree relative of an index patient with definite *SCN5A*-negative BrS.	 >90% agree
An SCB provocation test may be appropriate to aid segregation analysis in relatives with a rare variant of uncertain significance in *SCN5A* and symptoms and/or a family history of BrS ± sudden death.	 >90% agree

When to perform SCB provocation	Strength of evidence
An SCB test is advised for a patient with a type 2/3 Brugada ECG pattern and a history of cardiac or suspected cardiac syncope in the absence of significant structural heart disease.	 >90% agree
An SCB test is advised in a first-degree relative of a SADS[a] decedent whose circumstances of death are suggestive of BrS-related death (i.e. in sleep, during fever, and/or a suspicious ECG in the decedent). Comprehensive assessment and exclusion of alternative causes in the relative is required.	
An SCB test may be appropriate in a first-degree relative of a SADS[a] decedent where comprehensive assessment and exclusion of alternative causes in the relative and decedent have been performed.	 >90% agree
Following an unexplained sudden death where an autopsy has not been performed or has been performed inadequately, an SCB test may be appropriate in a first- or second-degree relative with a type 2/3 Brugada ECG pattern.	 >90% agree

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Dans les familles SCN5A+

An SCB test is only advised for subjects with a pathogenic *SCN5A* variant associated with BrS when there is a clear clinical rationale and only in an expert centre.

>90% agree

Areas of uncertainty	Strength of evidence
It is uncertain whether it is appropriate to offer an SCB test to genotype-negative subjects from *SCN5A* families.	 >70% agree

Areas of uncertainty	Strength of evidence
It is uncertain whether it is appropriate to perform an SCB test in an asymptomatic first-degree relative of an index patient who only has a drug-induced or fever-induced type 1 Brugada ECG pattern and no other ECG features, clinical or family history supportive of BrS.	 >90% agree
It is uncertain whether it is appropriate to perform an SCB test on a person aged under 30 presenting with atrial fibrillation for no other reason.	 >70% agree

When not to perform SCB provocation	Strength of evidence
Do not perform a diagnostic SCB test when a type 1 Brugada pattern has already been documented in the absence of suspected phenocopy.	 >90% agree
Do not routinely perform an SCB test in asymptomatic subjects with an incidental finding of type 2/3 pattern and no other ECG features, clinical or family history supportive of BrS.	 >70% agree

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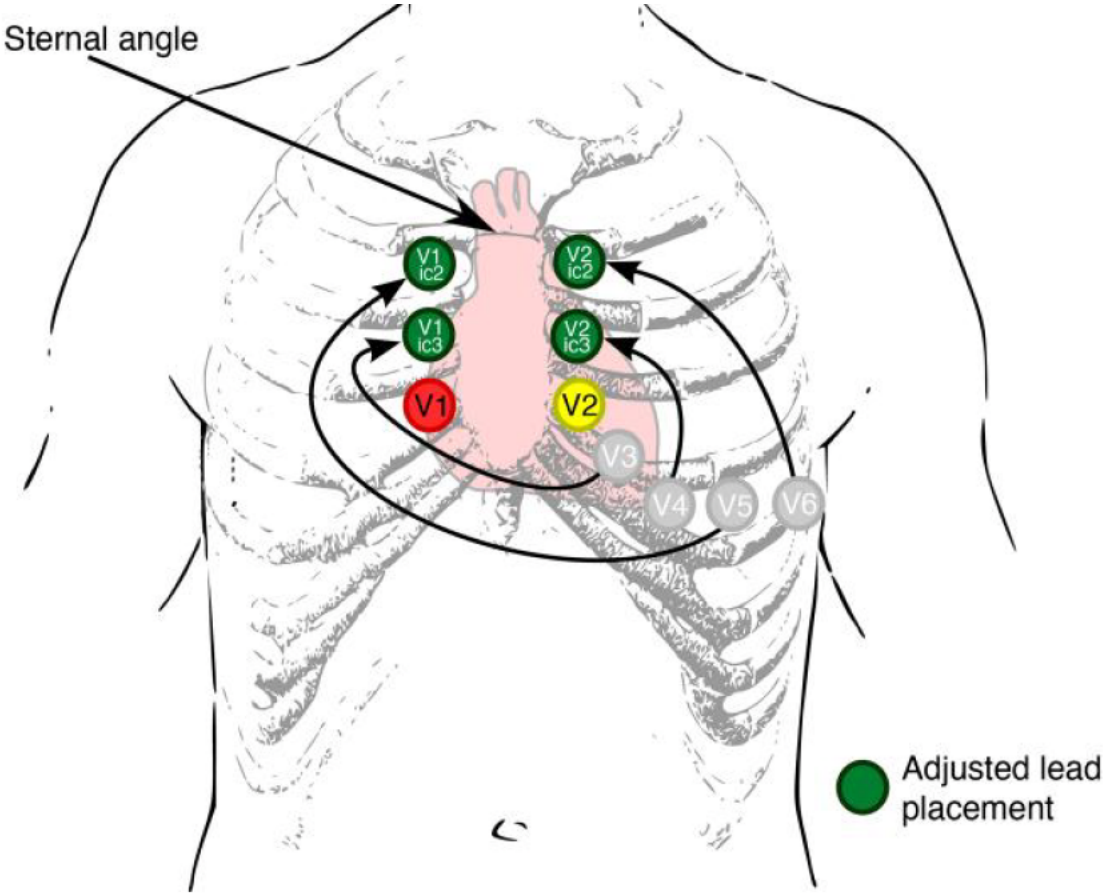
Ajmaline – Protocole & sécurité

- Ajmaline préférée (1 mg/kg IV sur 5–10 min)
- ECG V1/V2 hautes (2e–3e EIC) en utilisant V5 et V6, surveillance continue



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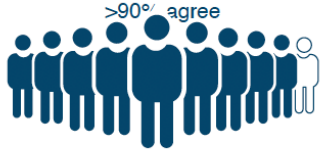
What to do	Strength of evidence
An institutional SCB test protocol is advised to ensure appropriate organisational aspects and standardisation. This includes minimum safety requirements, location, lead placement, and criteria for when to stop test.	 >90% agree
It is advised that the testing location is always in-hospital and is adjusted in case of presumed higher risk for adverse events (e.g. testing in the cardiac catheterisation laboratory in the case of pre-existent AV conduction disturbances, presence of an *SCN5A* variant, etc.).	 >90% agree
Minimum safety requirements for an SCB test include as follows: • Suitably trained personnel. • 12-Lead ECG recording system. • Equipment to observe vital signs. • Basic and advanced life support and defibrillator on standby. • Availability of isoproterenol in case of arrhythmia.	 >90% agree
It is advised that during the SCB test, ECG leads are recorded in higher right precordial positions (V1 and V2 in the second and/or third intercostal spaces).	
Ajmaline is preferred over flecainide when available for SCB testing.	 >90% agree

What to do	Strength of evidence
The criteria for stopping drug infusion during an SCB test are as follows: • Administration of the maximum dose according to body weight, • Type 1 Brugada ECG pattern, • QRS widening greater than 30% from baseline, • Ventricular arrhythmia more than isolated premature ventricular complexes, • Profound bradycardia or sinus arrest, • Type II second-degree or third-degree heart block, and/or • Allergic reaction.	 >90% agree
An SCB test is advised in children if symptoms and ECG findings indicate the need to make or exclude a diagnosis.	 >90% agree
An SCB test is not appropriate before puberty in the context of family screening when there are no symptoms or clinical or ECG abnormalities.	 >90% agree
It may be appropriate to repeat an SCB provocation test in patients with a previously negative test and an ongoing strong suspicion for BrS, once they are at least 16 years old.	 >90% agree

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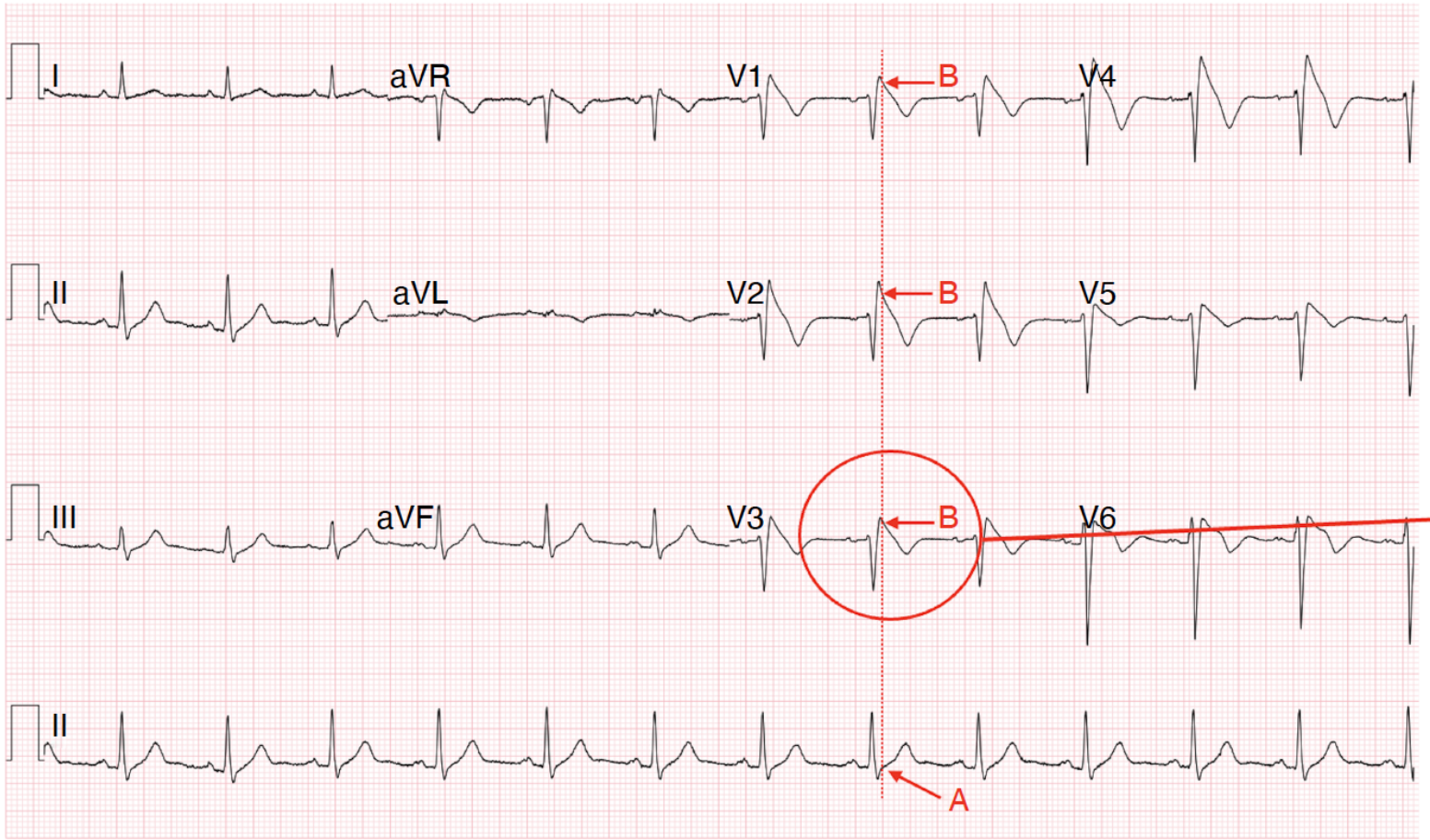
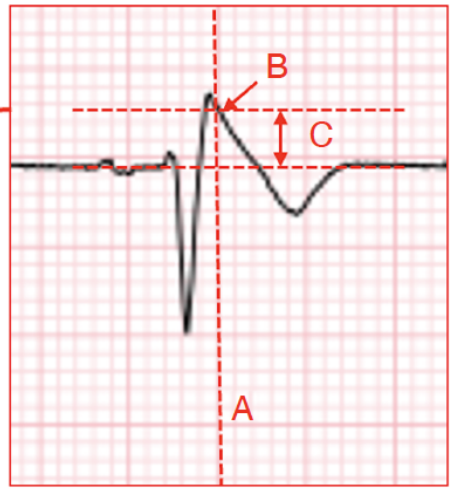


A – end of QRS in sequentially recorded limb lead

B – J point in presence of R’

C – ST elevation



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Adrénaline – Recommandations

- Les recommandations ne préconisent pas le test à l'épinéphrine dans le cadre du syndrome du QT long (LQTS).
- Néanmoins, le test à l'épinéphrine continue d'être réalisé dans les cas suspects de LQTS, notamment au Japon.
- Utile si CPVT suspecté et test d'effort impossible
- Résultat positif : TV, ES polymorphes sous stress adrénergique

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Isoproterenol pour suspicion de une CVDA

- Isoprotérénol à forte dose (45 µg/min) pendant trois minutes.

- Positif si des PVC polymorphes (>3 morphologies) et ≥1 couplet ont été observés ou si une TV monomorphe ou polymorphe soutenue ou non soutenue avec une morphologie prédominante de bloc de branche gauche non typique d'une TV du du RVOT a été observée.

- Pas d’avis du comité sur l’intérêt

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Nouveautés des recommandations 2025

- Consentement éclairé systématique
- Ajmaline recommandée, critères d'arrêt précisés
- SCN5A+ : test à éviter sauf indication forte
- Génétique du Brugada au centre de la prise en charge
- Adrénaline réservée aux cas sélectionnés de CPVT

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