

Mental Health and Cardiovascular Diseases

Relevant Guidelines

ESC 2025 Guidelines on mental health and CVD

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Introduction

According to the World Health Organization (WHO), mental health is a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community. However, despite its importance, there is not a single agreed definition for mental health.¹ Mental health conditions are affected by and interact with cardiovascular diseases (Figure 1).

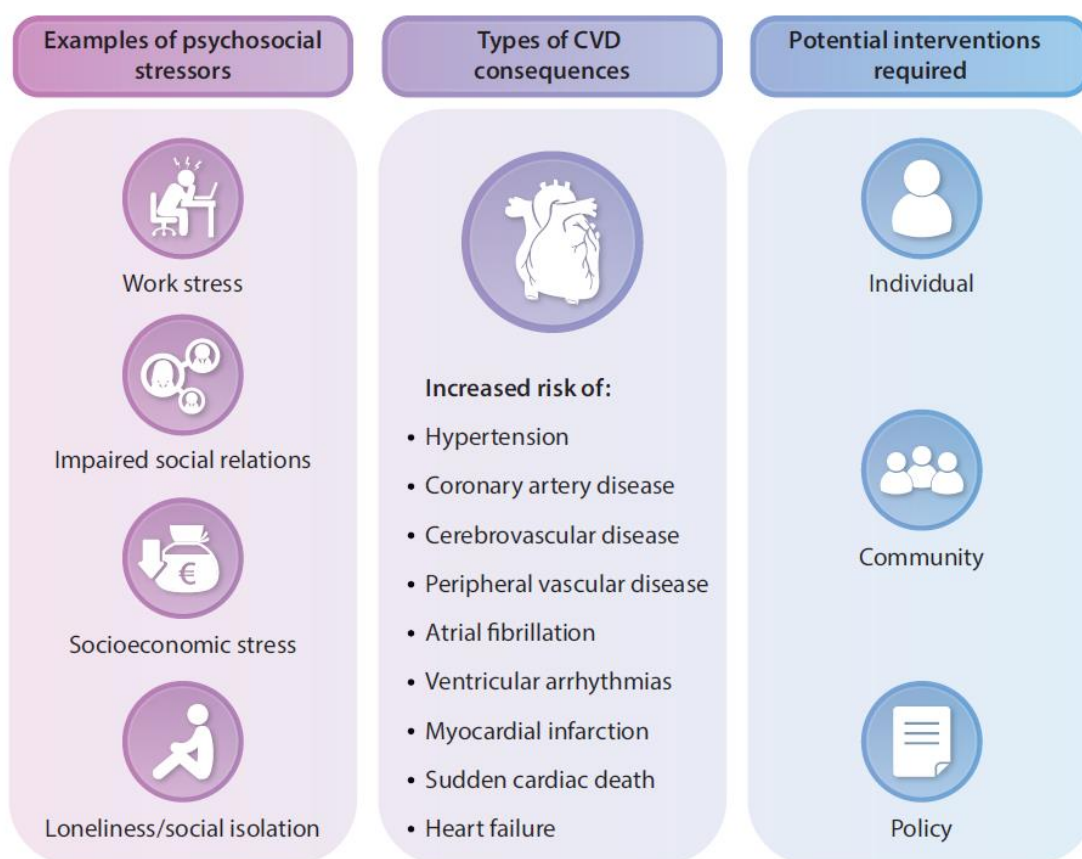


Figure 1. ESC 2025 GL on Mental Health and CVD. Sources of psychosocial stress as risk factors for cardiovascular disease.

Prevalence

The prevalence of depression or anxiety in various CVD states are indicated in Tables 1 and 2. Post-traumatic stress following heart disease is shown in Table 3.

Table 1. ESC 2025 GL on Mental Health and CVD. Prevalence of depression/depressive symptoms in people with cardiovascular disease

CVD	Prevalence data
ACS/Post-MI	Depressive symptoms were reported by 31% of individuals following MI. ¹³⁶ The prevalence of depression at the time of hospitalization was 40% in women under 60 years, compared with 22% in men of the same age group. Among those over 60 years, the prevalence was 21% in women and 15% in men. ¹³⁷ In 8580 people with ACS from 22 European countries who were ≥6 months post-hospitalization, ^a depressive symptoms were more frequent in women (32.3%) than men (21.2%), with moderate/severe depression in 12.7% of women and 7.4% of men. ¹³⁸
Chronic HF	Clinically significant depression affected 21.5% of people with HF, ranging from 33.6% via questionnaires to 19.3% via interviews, and 11% in NYHA class I to 42% in NYHA class IV. ¹⁵ Depression was more common in women with chronic HF (32.7% vs 26.1%), with rates of 11%–67% in women and 7%–63% in men, and increased with higher NYHA functional class. ¹⁵
Advanced HF and post-transplantation	Depression affects 25%–35% of individuals after HTx. ^{139–141} Depression was reported in 35% of individuals pre-transplant and 26.3% post-transplant. ¹⁴⁰ Depression occurs in 15%–39% of people with ventricular assist devices, often exceeding clinical cut-offs, particularly in older people. ^{114,142} People experiencing HTx had less depression than those with mechanical assist devices. ¹⁴³
AF	38% of people with AF met Beck Depression Inventory criteria for significant depression. ¹⁴⁴
ICD	Random-effects meta-analyses showed clinically relevant depression in 15.4% (95% CI 11.9%–18.9%) of people with an ICD at all timepoints post-insertion. ¹⁴⁵ The 2 year incidence of new-onset depression after ICD implantation was 11.3% in a national ICD registry. ¹⁴⁶ Depressive symptoms affected 20% of people with ICDs (12% mild, 6% moderate, 2% severe). Moderate to severe depression was more common in secondary prophylactic indications and in people experiencing ≥5 ICD shocks. ¹⁴⁷ People with ICDs and pacemakers had similarly increased levels of depression. ¹⁴⁸
ACHD	Individuals with ACHD have higher depression rates than the general population, with a weighted prevalence of 24% vs 15%. ¹⁴⁹ People with ACHD had a low and comparable suicide risk to the reference cohort. ¹⁵⁰
PH/PAH	In 2161 people with PH, the reported pooled prevalence of depression was 28% (95% CI 20.5–36.8). ¹³⁴ Smaller studies report depression prevalence in people with PAH ranging from 9% to 70%, linked to disease severity. ^{151–155}

ACHD, adult congenital heart disease; AF, atrial fibrillation; CI, confidence interval; CVD, cardiovascular disease; HF, heart failure; HTx, heart transplantation; ICD, implantable cardioverter-defibrillator; MI, myocardial infarction; NYHA, New York Heart Association; PAH, pulmonary arterial hypertension; PH, pulmonary hypertension.

^aThis study included: (i) coronary artery bypass graft surgery (including emergency procedures for acute MI), (ii) percutaneous coronary intervention (including emergency procedures for acute MI), (iii) acute MI (ST-elevation and non-ST-elevation MI), and (iv) acute myocardial ischaemia without infarction (troponin-negative).

Table 2. ESC 2025 GL on Mental Health and CVD. Prevalence of anxiety/anxiety symptoms in people with cardiovascular disease

CVD	Prevalence data
ACS/Post-MI	In an international cohort of people with CABG, PCI, post-MI, and ACS ≥ 6 months post-hospitalization, anxiety prevalence ranged from 12% to 42% in men and 22% to 64% in women, with moderate to severe anxiety ^a in 11% of men and 23% of women. ¹³⁸ At 3 months post-MI, 10% reported high anxiety, dropping to reference population levels ^b at 3–18 months. ¹⁷² In people diagnosed with SCAD, 41% had mild anxiety and 16% moderate to severe anxiety by questionnaire. Higher anxiety scores were more common in women, younger individuals, those with lower resilience, and those closer to the event. ¹⁷³
Chronic HF	Up to 72% of people with HF experience anxiety, with pooled estimates of 56% for symptoms, 29% for clinically significant anxiety, and 13.1% for anxiety disorders. Prevalence was higher in studies with more female participants. ¹⁷⁴ People with HF face a higher risk of anxiety, with 23% experiencing symptoms and 32% having both anxiety and depression. ¹⁷⁵
Advanced HF and post-transplantation	The pooled prevalence of anxiety among people experiencing HTx was 11% (95% CI 3.8%–28.5%). ¹⁷⁶
AF	People with AF exhibited a 28% prevalence of anxiety at baseline, comparable to controls, with symptoms persisting in 37% after 6 months. ¹⁴⁴ Among people undergoing cardioversion or ablation, 30% reported clinically significant anxiety. ¹⁷⁷
ICD	Among OHCA survivors, anxiety was reported in 36% of women vs 20% of men, with higher rates in younger women (<55 years) than older women (43% vs 28%). ¹⁷⁸ At 18 months post-OHCA, 32% showed anxiety symptoms. ¹⁷⁹ A large-scale registry reported 20% anxiety among people experiencing OHCA. ¹⁸⁰ Random-effects meta-analysis found clinically relevant anxiety in 23% (95% CI 18.3%–27.0%) of people with an ICD at all timepoints post-insertion. ¹⁴⁵ New-onset anxiety incidence was 15% at 24 months post-ICD implantation, with higher rates in women and the secondary prevention setting. ^{146,181} People with ICDs and pacemakers exhibited similarly elevated anxiety levels. ¹⁴⁸
ACHD	A review found anxiety symptoms to be common both immediately after CV events or surgery and during follow-up. ¹⁸² Anxiety prevalence was higher in people with ACHD (13%) compared with a historical cohort of people with non-Hodgkin lymphoma and German reference values (6%). ¹⁸³
PH/PAH	A total of 24 studies with 2161 people with PH reported a pooled prevalence of 37% for anxiety (95% CI 28.7–46.4). ¹³⁴ Smaller studies reported anxiety prevalence in people with PAH ranging from 9% to 58%, linked to disease severity. ^{151–154} Anxiety incidence was higher in people with PAH living in urban areas and in non-smokers or non-drinkers compared with their counterparts. ¹⁵⁴

ACHD, adult congenital heart disease; ACS, acute coronary syndrome; AF, atrial fibrillation; CABG, coronary artery bypass graft; CI, confidence interval; CV, cardiovascular; CVD, cardiovascular disease; HADS, Hospital Anxiety and Depression Scale; HF, heart failure; ICD, implantable cardioverter-defibrillator; MI, myocardial infarction; OHCA, out-of-hospital cardiac arrest; PAH, pulmonary arterial hypertension; PCI, percutaneous coronary intervention; PH, pulmonary hypertension; SCAD, spontaneous coronary artery dissection.

^aHADS anxiety score ≥ 8 .

^bNorwegian population.

Table 3. ESC 2025 GL on Mental Health and CVD. Prevalence of post-traumatic stress disorder/post-traumatic stress symptoms in people with cardiovascular disease

CVD	Prevalence data
ACS/Post-MI	Clinically significant PTSD 12%, and PTSS prevalence 0%–26% depending on type of measurement. ^{13,192} PTSD occurs in 7%–20% of people post-CABG. ¹³ PTSD prevalence among people with SCAD ranged from 28% to 35%. ^{173,193}
Advanced HF and post-transplantation	PTSD occurs in 11%–19% of people post-HTx. ¹³
ICD	12%–38% prevalence of PTSD in survivors of cardiac arrest. ^{13,145,178} Experiencing ≥ 1 appropriate ICD shocks was an independent risk factor for PTSD (OR 6.0; 95% CI 1.45–24.63; $P < 0.013$). ¹⁹⁴ A single study found higher PTSD prevalence in people with ICD who experienced electric storms compared with those who did not. ¹⁹⁵
ACHD	1%–30% prevalence of PTSD in people with ACHD, varying by measurement and geographical region. ^{196,197} Women and people with multiple medical encounters lacking psychosocial intervention are more likely to have PTSD. ¹⁹⁶

ACHD, adult congenital heart disease; ACS, acute coronary syndrome; CABG, coronary artery bypass graft; CI, confidence interval; CVD, cardiovascular disease; HF, heart failure; HTx, heart transplantation; ICD, implantable cardioverter-defibrillator; MI, myocardial infarction; OR, odds ratio; PTSD, post-traumatic stress disorder; PTSS, post-traumatic stress symptom; SCAD, spontaneous coronary artery dissection.

Screening Tools

Screening tools are presented in Tables 4 and 5.

Table 4. ESC 2025 GL on Mental Health and CVD. Psychometric properties of screening tools for anxiety and depression symptoms

Psychometric property	Whooley questions ^a	GAD-2 ^b	PHQ-2 ^b ≥ 2 points
Sensitivity	95% (95% CI 88–97)	91%	97%
Specificity	65% (95% CI 56–74)	37%	48%

CI, confidence interval; GAD, Generalized Anxiety Disorder; PHQ, Patient Health Questionnaire.

^aValidated in an unrestricted population, i.e. not specifically CVD.²³²

^bValidated in an Australian population.²³⁸

Table 5. ESC 2025 GL on Mental Health and CVD. Timing and tools for screening anxiety and depression symptoms

Timing of screening	Measurement	
	Anxiety symptoms	Depressive symptoms
(1) Following a new diagnosis of CVD, a CV event or procedure. May be during hospitalization.		
(2) At follow-up (e.g. annually) to determine change from baseline or previous measurement	GAD-2 followed by GAD-7 if positive	PHQ-2 followed by PHQ-9 if positive
(3) Anytime based on clinical judgement		

CV, cardiovascular; CVD, cardiovascular disease; GAD, Generalized Anxiety Disorder; PHQ, Patient Health Questionnaire.

Pharmacological Management

Pharmacological management is presented in Figures 2-4, and Tables 6 and 7.

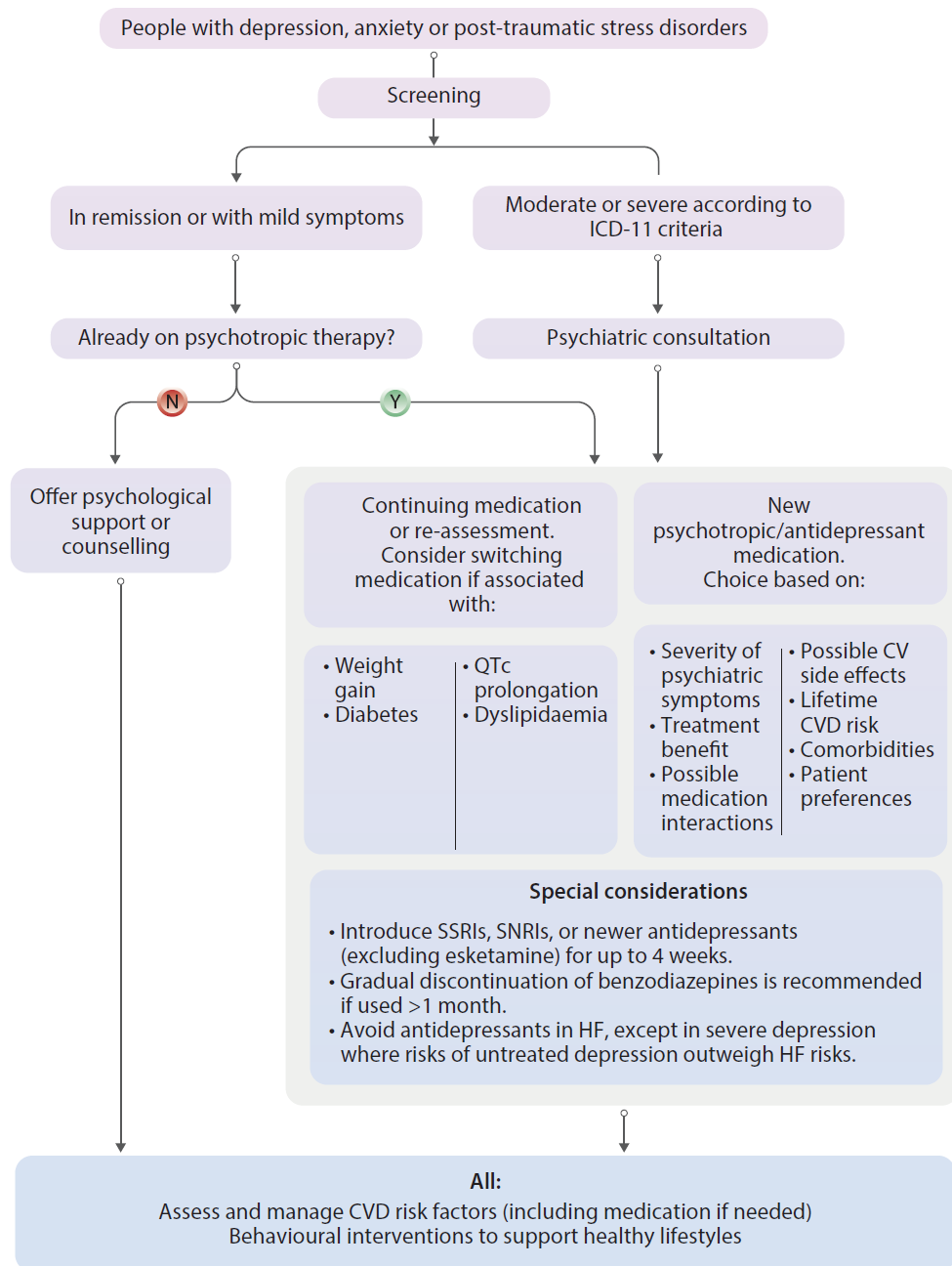


Figure 2. ESC 2025 GL on Mental Health and CVD. Pharmacological management of cardiovascular disease and depression, anxiety, or post-traumatic stress disorders.

CV, cardiovascular; CVD, cardiovascular disease; HF, heart failure; ICD, International Classification of Diseases; SNRI, serotonin and norepinephrine reuptake inhibitor; SSRI, selective serotonin reuptake inhibitor.

Table 6. ESC 2025 GL on Mental Health and CVD. Summary of the negative effect of different antipsychotics on cardiovascular risk factors

Drug	Weight gain	Hyperglycaemia	LDL cholesterol	HDL cholesterol	Total cholesterol	Triglycerides
Haloperidol	0	++	ND	ND	++	++
Ziprasidone	0	+	0	0	+	+
Aripiprazole	+	++	+	+	++	+
Lurasidone	+	0	+	+	+	+
Cariprazine	+	++	0	+	0	+
Fluphenazine	+	ND	ND	ND	ND	ND
Amisulpride	+	0	ND	+++	++	++
Brexpiprazole	+	+	++	0	++	0
Flupentixol	+	ND	ND	ND	ND	ND
Asenapine	++	0	ND	ND	ND	ND
Risperidone	++	+	++	++	++	+
Paliperidone	++	+	++	++	++	+
Quetiapine	++	+	+++	++	+++	++
Iliperidone	++	++	ND	ND	+	++
Sertindole	+++	+	ND	ND	++	+
Zotepine	+++	+++	ND	ND	ND	+++
Clozapine	+++	+++	ND	ND	+++	+++
Olanzapine	+++	++	+++	+++	+++	+++

HDL, high-density lipoprotein; LDL, low-density lipoprotein; +, strength of effect; ND, no data.

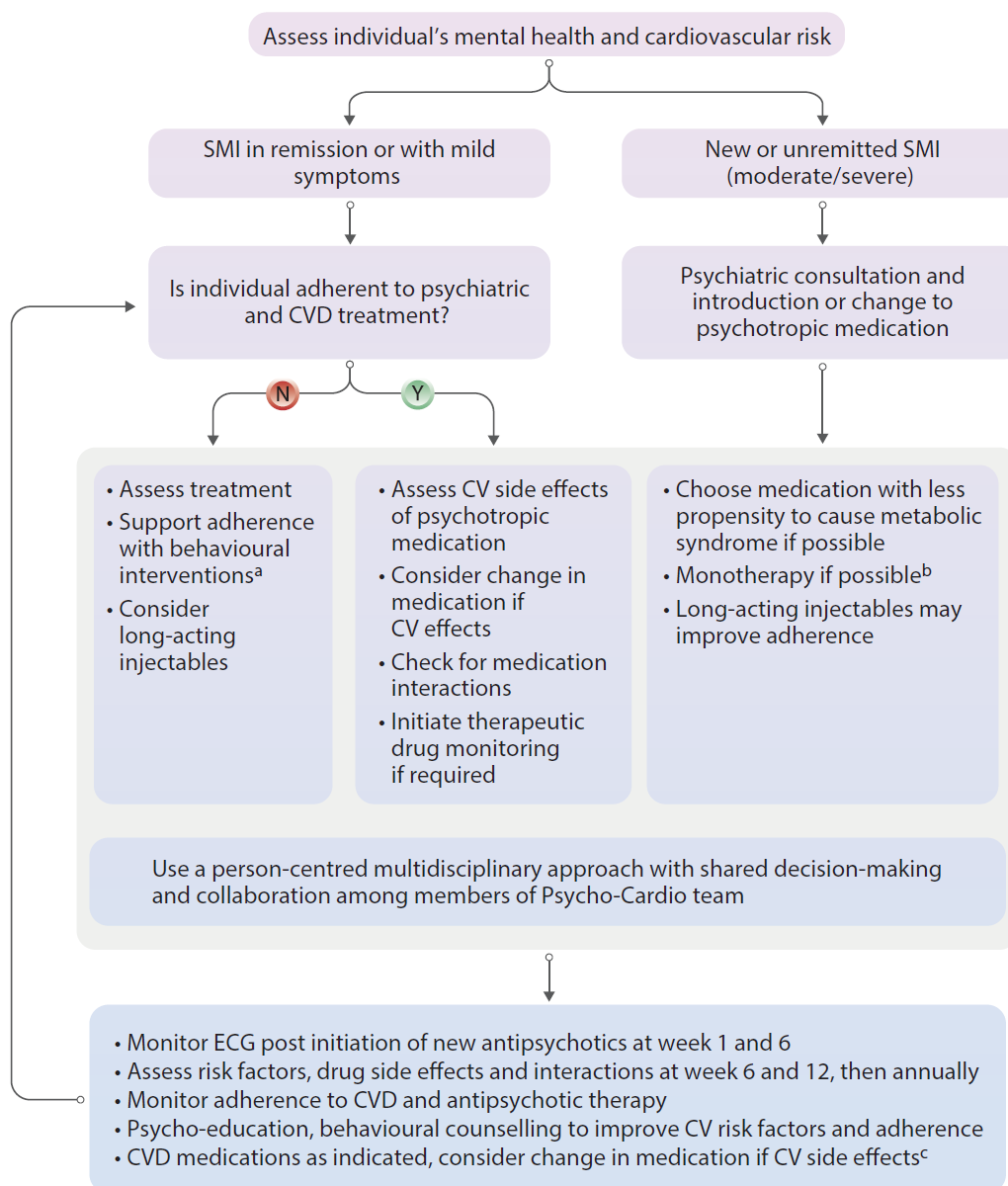


Figure 3. ESC 2025 GL on Mental Health and CVD. Management of people with cardiovascular disease and severe mental illness.

CV, cardiovascular; CVD, cardiovascular disease; ECG, electrocardiogram; GLP-1 RA, glucagon-like peptide-1 receptor agonist; SGLT-2i, sodium–glucose co-transporter-2 inhibitor; SMI, severe mental illness. ^aVarenicline or bupropion can be used to support smoking cessation behavioural interventions. ^bMonotherapy for SMI if possible; antipsychotics with lower propensity to worsen CVD risk (psychiatrist to advise). → choice based on severity of symptoms, risk of relapse, medication interactions, comorbidities, and person-centred/shared decision-making preferences. ^cGLP-1 RA and SGLT-2i for diabetes; Metformin first line for antipsychotic associated weight gain.

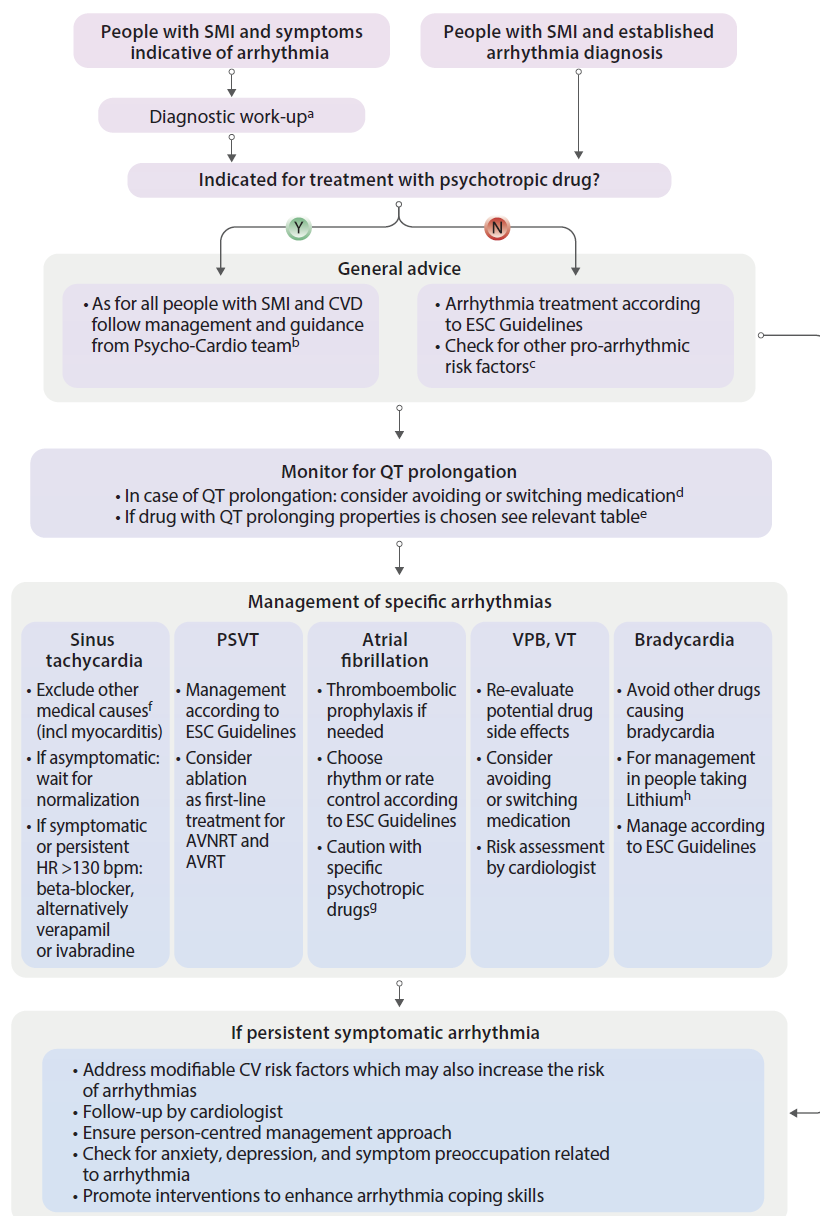


Figure 4. ESC 2025 GL on Mental Health and CVD. Management of people with severe mental illness and arrhythmias.

AVNRT, atrioventricular nodal reentry tachycardia; AVRT, atrioventricular reentry tachycardia via accessory pathway; bpm, beats per minute; CV, cardiovascular; CVD, cardiovascular disease; ECG, electrocardiogram; ESC, European Society of Cardiology; HR, heart rate; PSVT, paroxysmal supraventricular tachycardia; SMI, severe mental illness; VPB, ventricular premature beat; VT, ventricular tachycardia. ^aHistory, symptoms, status, 12-lead ECG, Holter-ECG and/or event recorder, echocardiography, blood test and other evaluation if appropriate. ^bSee [Figure 13](#). ^cSuch as hypertension, heart failure, ischaemic heart disease, electrolyte imbalance, history of arrhythmia, or syncope, family history of sudden cardiac death. ^dSpecial caution with quetiapine, olanzapine, risperidone, iloperidone, amisulpride, sertindole. ^eSee [Table 7](#). ^fSuch as anaemia, hyperthyroidism, infection/sepsis, pain. ^gSpecial caution with clozapine, chlorpromazine, olanzapine, quetiapine, risperidone. ^hSee [Section 7.6.1](#).

Table 7. ESC 2025 GL on Mental Health and CVD. Management of psychotropic drugs with QT interval prolongation properties

Action	Supporting information
Assess symptoms	Typically, asymptomatic In case of torsades de pointes: palpitations, dizziness, syncope, cardiac arrest.
Diagnostic work-up	• 12-lead ECG providing QTc at baseline and after 1, 6, and 12 weeks after initiating drug • ECG more often in case of QT prolongation • Use Fridericia formula for heart rate correction if there is tachycardia • Check electrolytes: potassium, calcium, magnesium • Ambulatory ECG monitoring in people with symptoms • Exclude possible inherited long QT syndrome.
Management	Special caution with: sertindole, amisulpride, ziprasidone, iloperidone, risperidone, olanzapine, and quetiapine • Always aim for the lowest effective dose • Check for other QT-prolonging drugs • Check for drug interactions • Always special caution when new medication is started • Consult https://www.crediblemeds.org/ for specific information on QT-prolonging drug effects • Correct electrolyte imbalances • Address other reversible QT-prolonging factors (e.g. bradycardia, hypothyroidism, starvation/eating disorders, alcohol and substance abuse, myocardial ischaemia) Note other non-reversible potentially QT-prolonging factors: heart failure, ventricular hypertrophy, recent conversion from atrial fibrillation, impaired hepatic/renal function, female sex, age over 65 years If QTc is prolonged (>470 ms) at baseline, treatment initiation is generally not recommended and should be carefully considered based on individualized risk-benefit assessment (Psycho-Cardio team)^a.
Special precautions	Stop treatment with antipsychotic drug (and any other potentially QT-prolonging medication) if: • QTc > 500 ms^b • Increase in QTc > 60–70 ms from baseline^c.

ECG, electrocardiogram; QTc, corrected QT interval.

^aQTc prolongation (>470 ms) during treatment warrants repeated ECG documentation and thorough evaluation of symptoms and additional risk factors for QT prolongation. Dose reduction or switching to a different antipsychotic drug may be considered in selected cases after individualized risk-benefit assessment (Psycho-Cardio team).

^bRequest urgent consultation with Psycho-Cardio team/cardiologist.

^cRequest urgent consultation with Psycho-Cardio team/cardiologist, repeat ECG.

Sex Differences

Sex differences are presented in Figure 5.

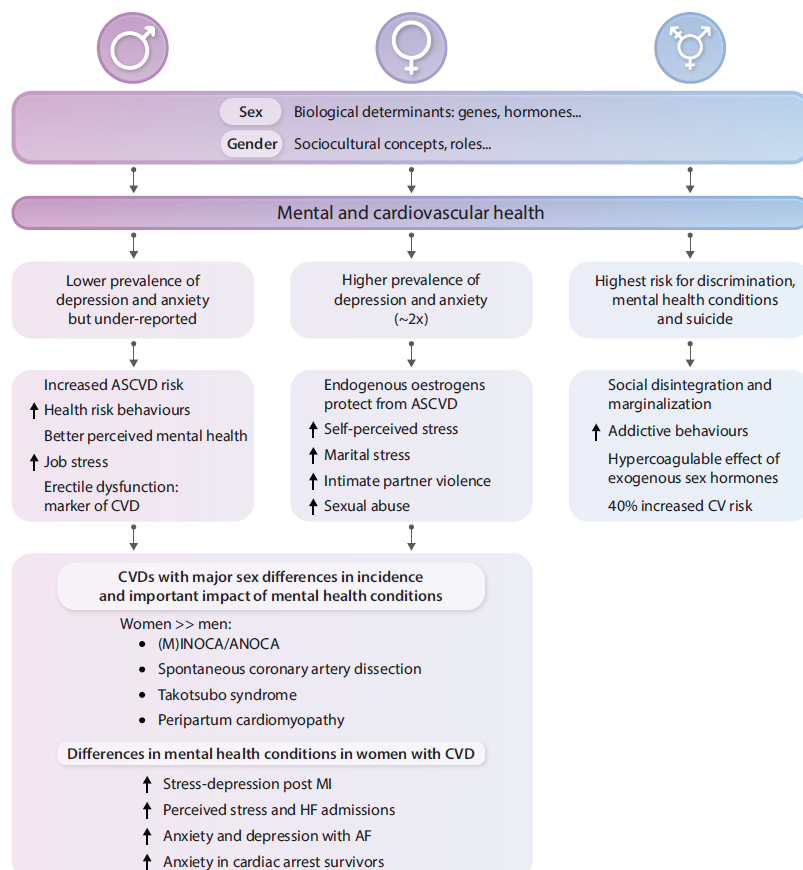


Figure 5. ESC 2025 GL on Mental Health and CVD. Sex and gender differences in the psycho-cardio interaction.

AF, atrial fibrillation; ANOCA, angina with non-obstructive coronary arteries; ASCVD, atherosclerotic cardiovascular disease; CV, cardiovascular; CVD, cardiovascular disease; HF, heart failure; MI, myocardial infarction; (M)INOCA, (myocardial infarction) ischaemia with non-obstructive coronary arteries.

References

1. Bueno H, et al. 2025 ESC Clinical Consensus Statement on mental health and cardiovascular disease: developed under the auspices of the ESC Clinical Practice Guidelines Committee. *Eur Heart J*. 2025. doi: 10.1093/eurheartj/ehaf191