

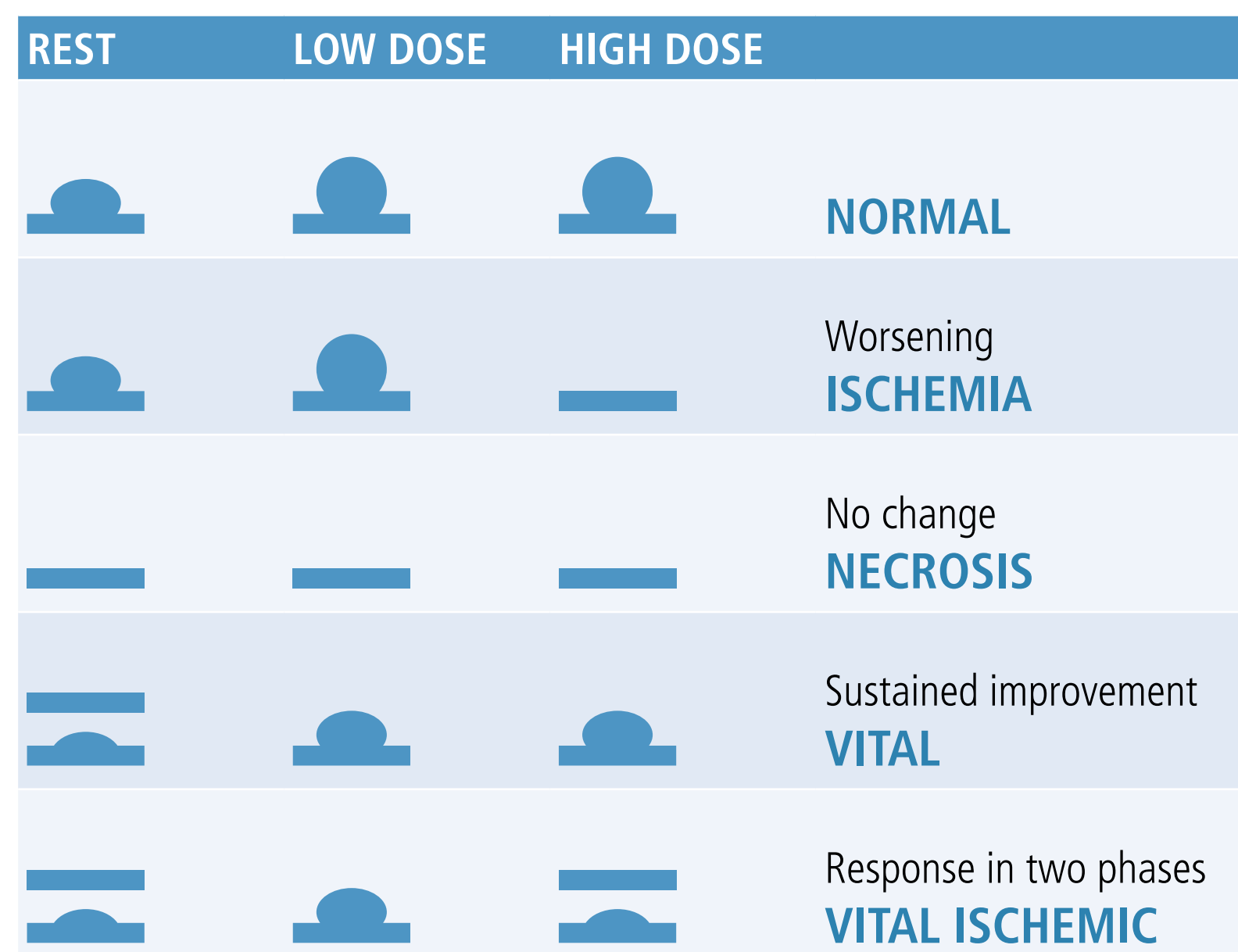
STRESS ECHOCARDIOGRAM

Non-ischemic indications

INDICATION	EVALUATION	TYPE
Diastolic function	Diastolic dysfunction Increase in PAsP and E/E' Correlation of symptoms/signs of HEART FAILURE	Physical
CARDIOMYOPATHIES		
Hypertrophic cardiomyopathy	Dynamic obstruction to LV outflow tract Diastolic dysfunction Dynamic mitral insufficiency Inducible ischemia and correlation with symptoms Timing of therapy and surgery Lifestyle adjustment	Physical
Dilatative cardiomyopathy	Contractile reserve (increase in EF > 5% or GLS strain > -2%) Inducible ischemia Diastolic reserve PAsP variations Dynamic mitral insufficiency Pulmonary congestion	Physical
Cardiac resynchronization therapy	Contractile reserve Inducible ischemia Contractile reserve Vitality in scarring areas Dynamic dyssynchrony	Dobutamine Physical Dobutamine
NATIVE VALVULAR HEART DISEASE		
Aortic stenosis	Asymptomatic severe aortic stenosis Symptomatic non-severe aortic stenosis Low-flow/low-gradient aortic stenosis	Physical Physical/dobutamine Physical/dobutamine
Primitive mitral insufficiency	Asymptomatic severe aortic mitral insufficiency Symptomatic non-severe mitral insufficiency	Physical Physical
Secondary mitral insufficiency	Variations in the severity of mitral insufficiency with exercise Increase in PAsP Asymptomatic mitral insufficiency	Physical
Aortic insufficiency	Symptomatic non-severe aortic insufficiency Asymptomatic severe aortic mitral insufficiency	Physical Physical
Mitral stenosis	Symptomatic non-severe mitral stenosis	Physical/dobutamine
Multivalvular pathology	Discordance of symptoms/severity of valve pathology	Physical
PROSTHESES		
Prosthetic aortic valves	Stenosis Prosthesis/patient match with or without low-flow	Physical/dobutamine
Prosthetic mitral valves	Stenosis Prosthesis/patient match	Physical/dobutamine
Mitral valve annuloplasty	Iatrogenic mitral stenosis	Physical
PULMONARY HYPERTENSION		
Pulmonary hypertension	Symptoms and pulmonary pressure during exertion	Physical
Pulmonary heart	RV contractile reserve PASP	Physical
ATHLETE'S HEART		
Symptomatic athletes	Assessment of exercise response and symptoms	Physical
CONGENITAL HEART DISEASE		
Interatrial defect	PAsP RV contractile reserve	Physical Dobutamine
Tetralogy of Fallot	RV contractile reserve LV contractile reserve	Physical
Coarctation of the aorta	Assessment of the degree of severity LV contractile reserve	Physical
Univentricular heart	Assessment of contractile reserve Hemodynamic stress assessment	Physical

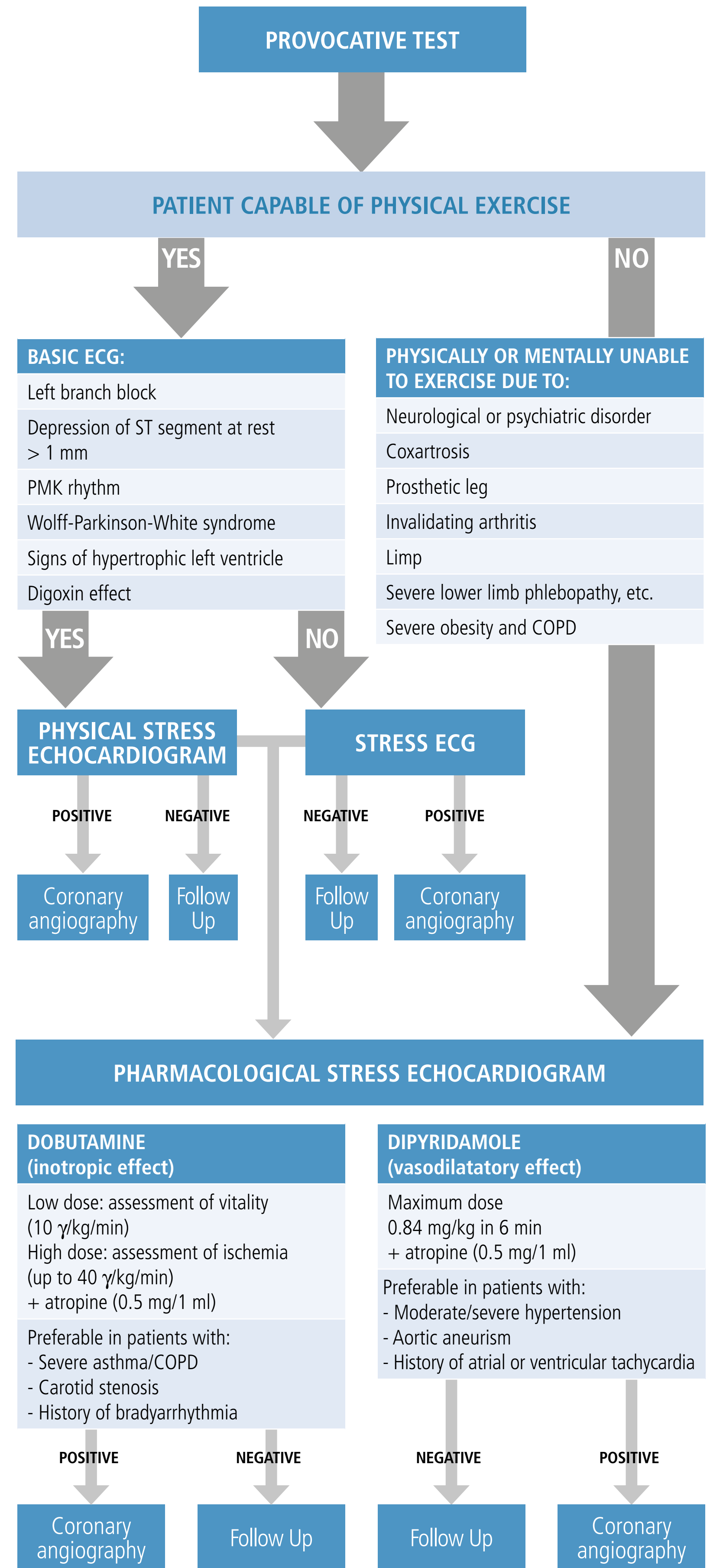
Ischemic indications

- Study of global and regional kinesis
- Assessment of coronary flow reserve
- Assessment of ischemia that may be induced in high-risk cardiovascular patients
- Stratification of risk and prognosis in patients with established diagnosis (post-SCA)
- Assessment of pre-operative risk in ischemic patients, high-risk cardiovascular patients and patients with poor tolerance of physical exertion
- Etiological assessment of dyspnea due to exertion
- Follow-up subsequent to percutaneous or surgical revascularization
- Assessment of ischemia that may be induced and myocardial vitality in patients with chronic ischemic heart disease
- Assessment of intermediate grade coronary artery disease (coronography/coronary CT scan)



Diagnostic criteria

- Maximum heart rate
- Echocardiographic positivity (new akinesia, worsening of ischemia)
- Chest pain
- Changes to ECG (alteration of st > 2 mm segment)



D'Andrea A, Martone F, Liccardo B. Integrated Cardiological Diagnostics, Ospedali dei Colli hospital, Monaldi - Lanzetta P, et al. The clinical use of stress echocardiography in nonischemic heart disease: recommendations from the European Association of Cardiovascular Imaging and the American Society of Echocardiography. J Am Soc Echocardiogr. 2017 Feb;30(2):101-138 - Sicari R, Cortigiani L. The clinical use of stress echocardiography in ischemic heart disease. Cardiovasc Ultrasound. 2017 Mar 21;15(1):2



Dobutamine

Indications

- Identification of myocardial ischemia
- Identification of myocardial vitality

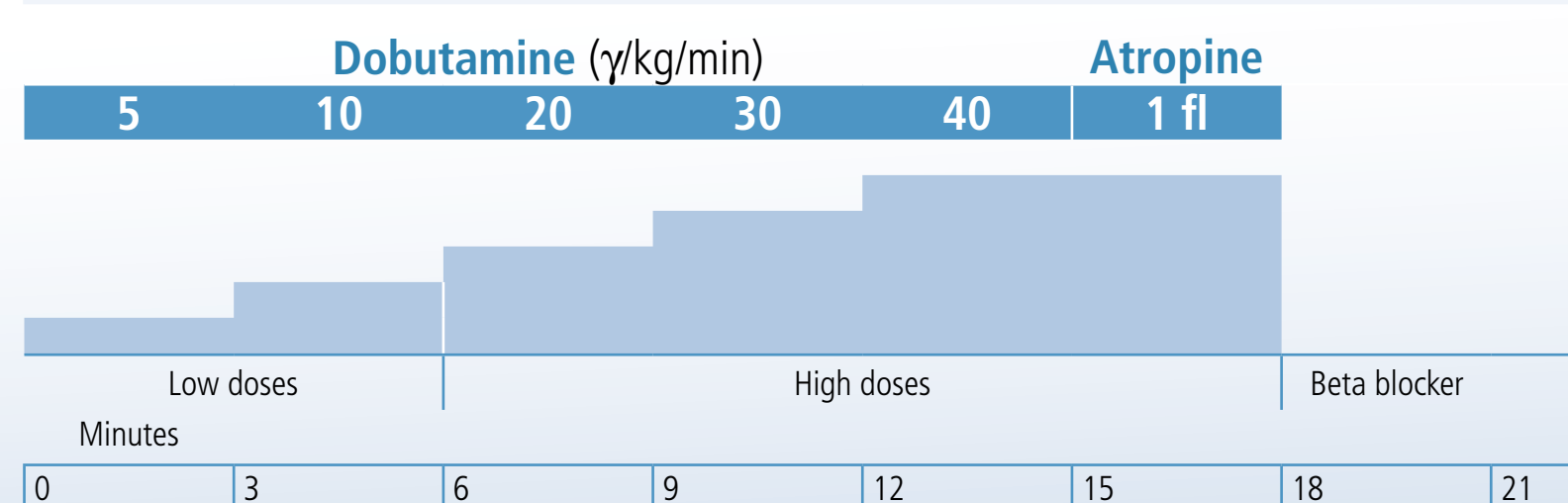
Contraindications

- Repetitive atrial arrhythmias (atrial fibrillation, supraventricular paroxysmal tachycardia)
- Complex ventricular arrhythmias (polymorphous extrasystoles, ventricular tachycardia)
- Moderate to severe arterial hypertension
- Aortic aneurism

Dosage scheme

1 fl dobutamine (250 mg in 30 ml) + 20 ml saline solution (concentration 5000 γ /ml)

Weight (kg)	Infusion speed (ml/h)				
	0 minutes	3 minutes	6 minutes	9 minutes	12 minutes
50	5 γ /kg/min	10 γ /kg/min	20 γ /kg/min	30 γ /kg/min	40 γ /kg/min
60	3.0	6.0	12.0	18.0	24.0
65	3.6	7.2	14.4	21.6	28.8
70	3.9	7.8	15.6	23.4	31.2
75	4.2	8.4	16.8	25.2	33.6
80	4.5	9.0	18.0	27.0	36.0
85	4.8	9.6	19.2	28.8	38.4
90	5.1	10.2	20.4	30.6	40.8
95	5.4	10.8	21.6	32.4	43.4
95	5.7	11.4	22.8	34.2	45.6
100	6.0	12.0	24.0	36.0	48.0



Antonello D'Andrea and Ercole Tagliamonte, Presidio Ospedaliero Umberto I, Nocera Inferiore, Salerno; Francesca Martone and Biagio Liccardo, AORN Ospedali dei Colli, Napoli; University of Campania Luigi Vanvitelli; Marco Maglione, GMKT Esaote

Dipyridamole

Indications

- Identification of myocardial ischemia

Contraindications

- 2nd and 3rd degree AV block
- Sinus node disease
- Bronchial asthma
- Significant carotid artery stenosis (common or internal carotid artery > 50%)

Contraindications for atropine

- Glaucoma
- Severe prostate hypertrophy

Dosage scheme

Dipyridamole (10 mg/2 ml) by body weight to be administered slowly by bolus in 6 minutes

Number of vials to administer	
Weight (kg)	Dosage
50	4 and 1/2
60	5 and 1/4
70	6
80	6 and 3/4
90	7 and 1/2
100	8 and 1/4
110	9

Dipyridamole Dosage for body weight	Atropine 1 fl	Aminophylline
0	0	0
6	0	0
10	0	0
15	0	0
Antidote	0	0