LIV Jornadas SOLACI
Ciudad de Panamá

Intervención coronaria en pacientes octogenarios

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INTRODUCCIÓN

- La enfermedad coronaria es la causa principal de muerte en > 65 años
  - Síndrome coronario agudo es la causa del 30% de estas muertes.
- La población adulta > 65 años ha crecido tanto en número como en proporción:
  - 1970: 9.8% de la población de USA.
  - 2012: 13.7%.
  - 2030: Se estima que será > 20%.
  - 2060: >23%.
- Pacientes octogenarios (≥ 75 años):
  - 2012: 3.7%.
  - 2020: 3.9%.
  - 2030: 5.4%.
  - 2060: >23%.

Geriatr Cardiol 2015; 12: 174−184.
Br J Cardiol 2011; 18: 73–76.
Circulation. 2025;152:e494–e525.

INTRODUCCIÓN

- Incremento anual de > 160,000 octogenarios en USA
  - Habrá un incremento de > 5 veces para el año 2040:
    - Incremento de la expectativa de vida y baja fertilidad.
- El principal factor de riesgo para EAC es la edad:
  - La prevalencia incrementa marcadamente a medida que la edad aumenta:
    - 83% de los hombres y 87% de las mujeres > 80 años en USA, tienen EAC
    - 66% de todas las muertes por enfermedad CV, ocurren en pac > 75 años
- Tienen lesiones coronarias más complejas:
  - Calcificadas: 46%.
  - Tortuosas, ostiales, multivasos y TCI.

Geriatr Cardiol 2015; 12: 174−184.
Br J Cardiol 2011; 18: 73–76.

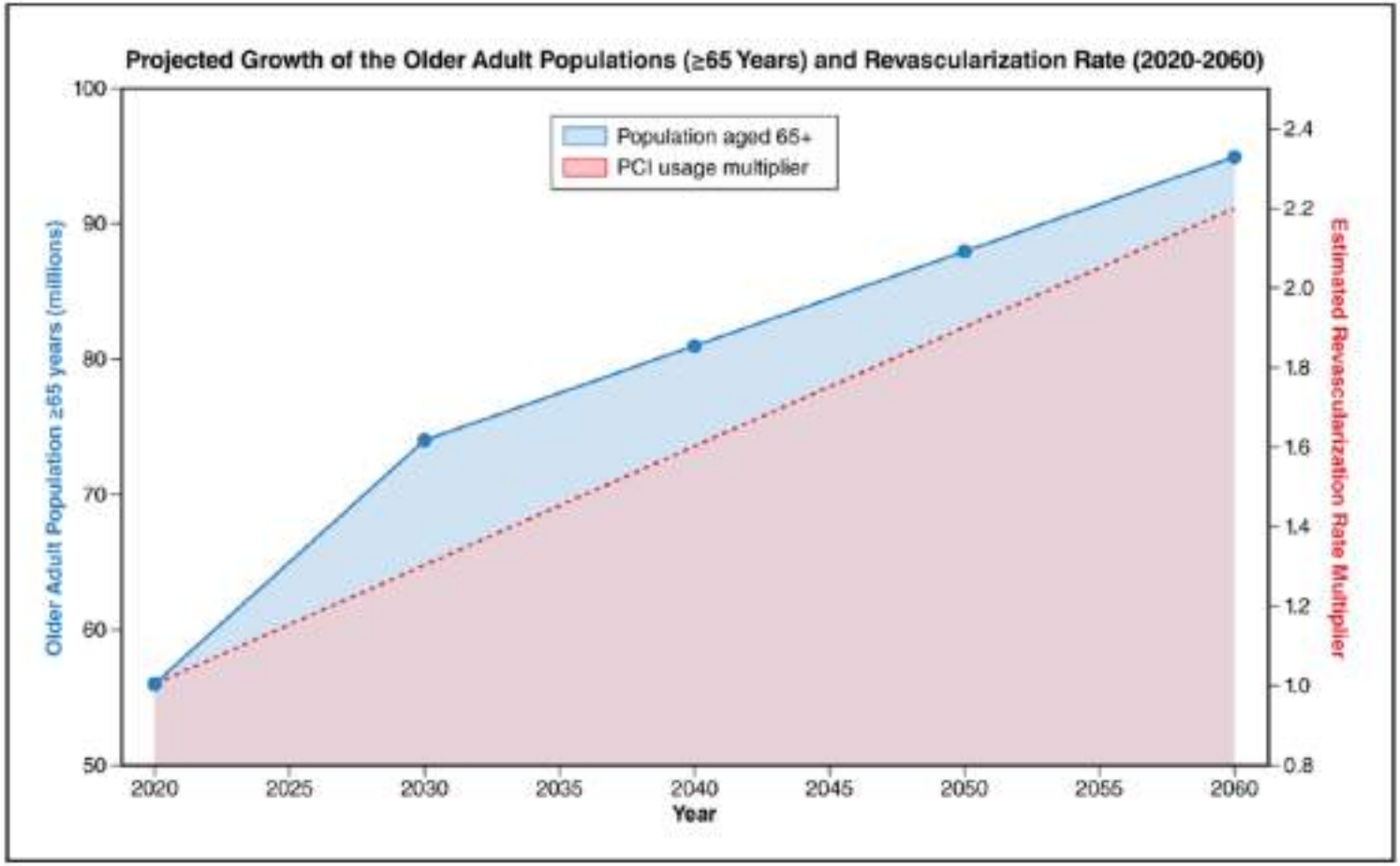

Figure 1. Projected growth of the older adult population (≥65 years) along with the projected growth of revascularization procedures in the older adult population from 2020 to 2060 in the United States.

The blue solid line indicates the projected US population ≥65 years of age based on US Census Bureau data. The red dashed line shows an estimated percutaneous coronary intervention (PCI) usage multiplier, which reflects the relative increase in demand for PCI procedures compared with the baseline year 2020. This multiplier accounts for both demographic aging and projected procedural utilization trends. The PCI usage multiplier is an extrapolated index, assuming proportional growth in procedure volume in response to population aging and comorbidity burden. Adapted from US Census Bureau data (https://www.census.gov/library/stories/2023/05/2020-census-united-states-older-population-grew.html).

Circulation. 2025;152:e494–e525.

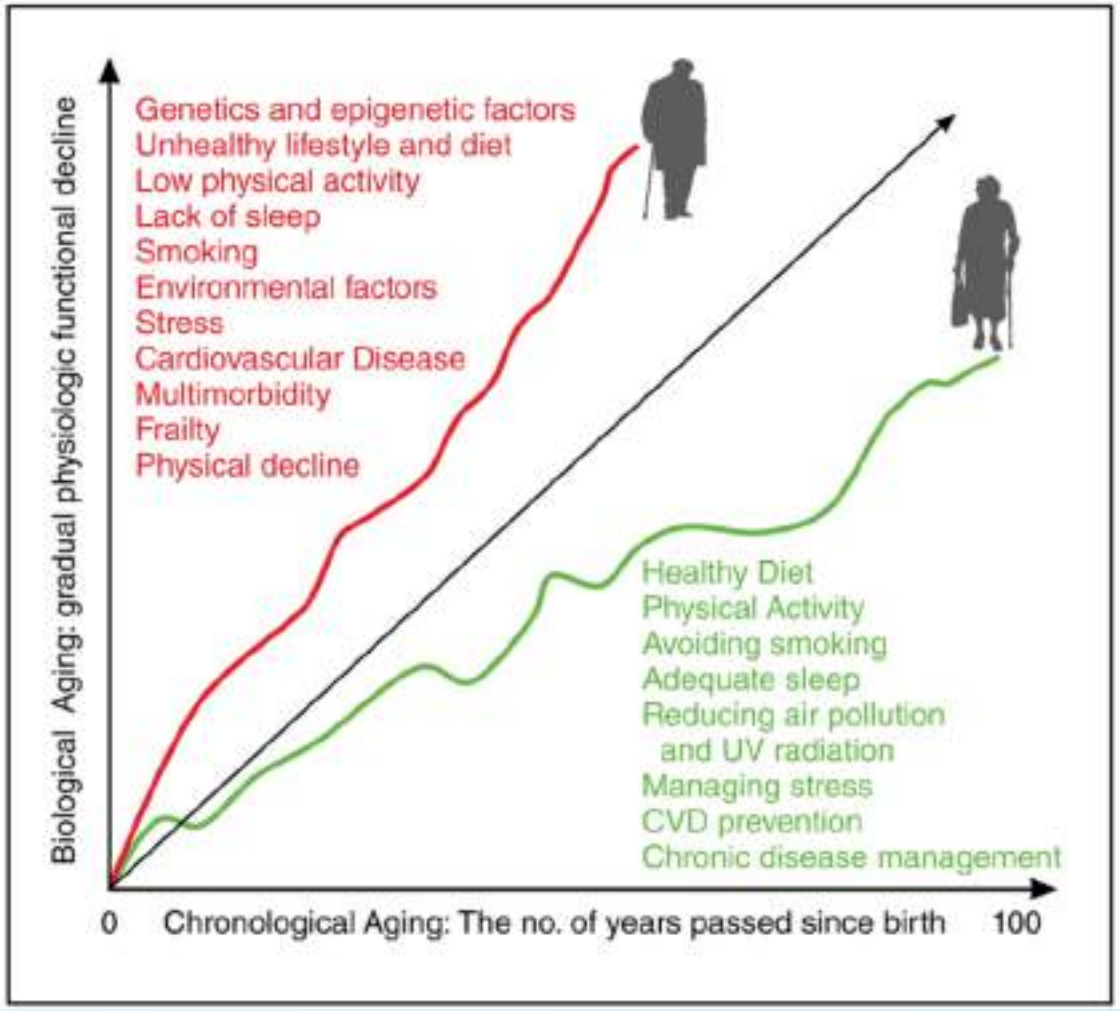

Figure 2. Chronologic versus biologic aging and the various factors that influence the biologic aging process among older adults with cardiovascular disease.
Multiple modifiable factors, including nutrition, physical activity, sleep, stress management, and environmental exposures, have been shown to influence biologic aging and cardiovascular risk. These upstream determinants remain essential targets for promoting healthy aging and may also influence the success of revascularization and recovery in older adults. CVD indicates cardiovascular disease; and UV, ultraviolet.

Circulation. 2025;152:e494–e525.

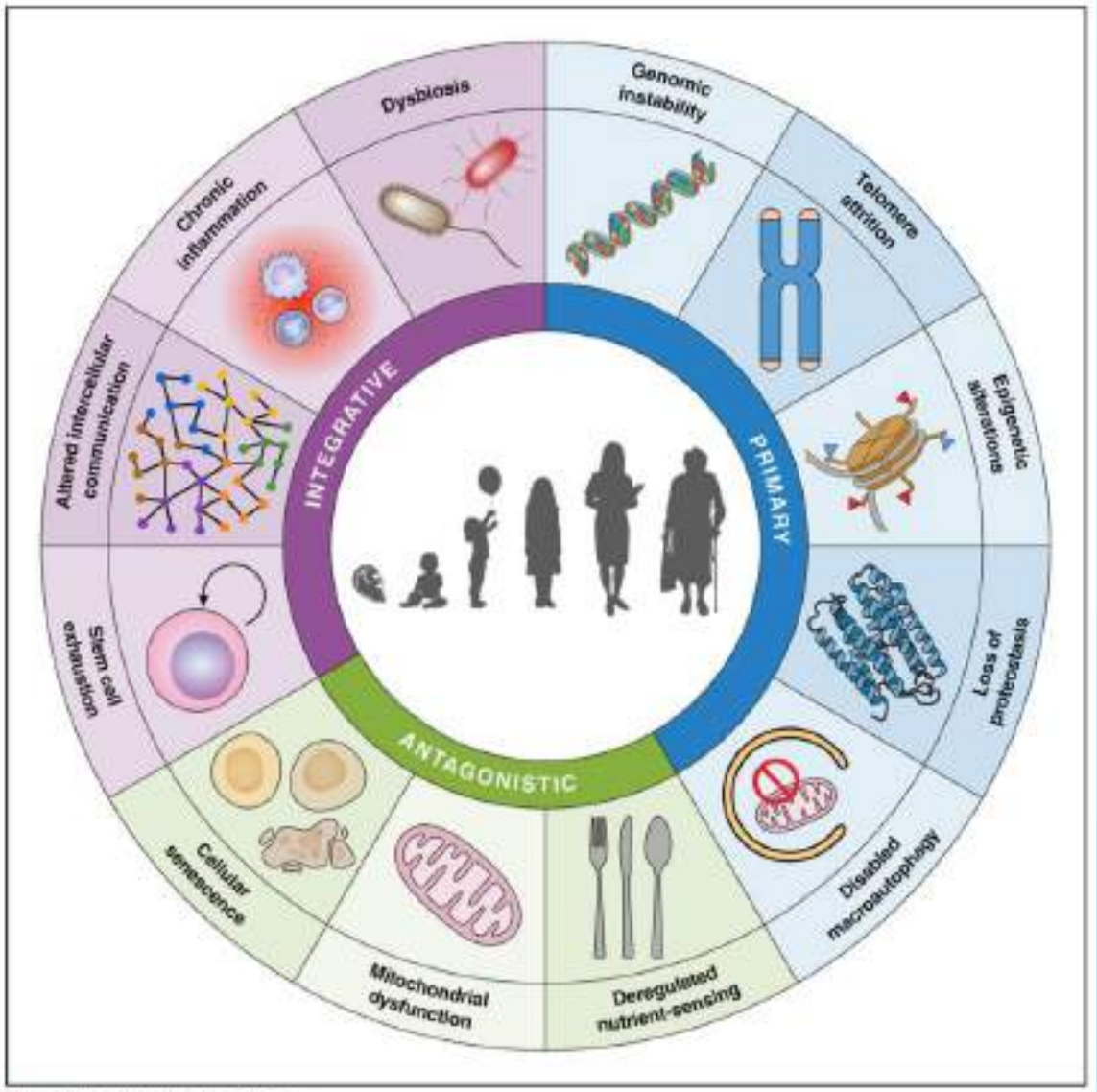

Figure 3. The 12 hallmarks of aging.

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Table 1. The 5Ms of Geriatrics: A Framework to Address Key Aspects of Aging Relevant to Cardiovascular Procedural Decision-Making, Including the Catheterization Laboratory and Operating Room

5Ms of Geriatrics*	Examples	Relevance in the catheterization laboratory
Matters Most	Goals and values	Procedures under DNR status Options for limited resuscitation
Medications	Changes in pharmacokinetics, pharmacodynamics, hepatic and renal function with aging Polypharmacy	Absorption and bioavailability Drug–drug interactions Consider lower doses, slower titration Bleeding risks
Mind	Cognition (eg, mild cognitive impairment, dementia) Delirium (eg, hyperactive, hypoactive, mixed) Mood (eg, anxiety, depression)	Baseline cognition, need for HCP involvement in consent Risk of delirium because of the procedure, pain, medications Postprocedure mental health
Mobility	Disability Functional status (eg, IADL, BADL) Falls Sarcopenia	Baseline function and independence may predict outcomes and recovery Reduced muscle mass can impair mobility and recovery Falls and bleeding risk for DAPT considerations
Multicomplexity	Frailty Multimorbidity, competing chronic conditions Aging physiology (eg, renal function, sensory impairment) Social environment, caregiver stress	Baseline frailty may predict outcomes and recovery Interaction of dominant diseases (eg, pulmonary disease, renal disease) Increased bleeding risk Contrast-induced nephropathy

BADL indicates basic activities of daily living; DAPT, dual antiplatelet therapy; DNR, do not resuscitate; HCP, health care proxy or health care provider; and IADL, instrumental activities of daily living.

*Geriatric syndromes and clinical implications.

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Table 2. Geriatric Syndromes and Their Impact on Coronary Heart Disease Prevalence, Prognosis, and Management

Geriatric syndrome	Diagnosis and prevalence	Prognosis	Disease management
Multimorbidity	≥2 chronic conditions (cardiac or noncardiac) that are active simultaneously Prevalence: 63% of adults 65–74 y, 77% of adults 75–84 y, 83% of adults ≥85 y	↑ Short- and long-term prognostic risks attributable to CVD and uncontrolled CVD and non-CVD risk factors	Confounds customary CVD symptoms and signs Multiple diseases and clinicians often result in desynchronized or contradictory aspects of care ↑ Likelihood that patients will experience high therapeutic burden
Frailty	State of vulnerability relating to diminished physiologic reserve across multiple body systems Multiple definitions; 2 leading theories: physical phenotype and accumulation of deficits Prevalence: 10%–60% of older adults, higher in those with greater CVD burden; depends on measurement tool and cutoff chosen to define frailty	↑ Risk from CVD and medical, device, percutaneous catheter, and surgical therapies used to treat CVD ↑ Risks, disability, falls, rehospitalization, poor quality of life, death	Guideline-based therapy and procedures commonly overlook the effect of frailty on recommendations Intensive care, bed rest, and functional decrements associated with many conventional therapies can exacerbate frailty and functional decline Nutrition and exercise may help mitigate frailty and risks of frailty
Cognitive decline	Mild cognitive impairment: ↓ cognitive function without loss of function Prevalence estimates vary with population and methods, but increases with age, generally in the range of 2%–5% (60–65 y) to >20%–40% (≥90 y) Dementia: severe memory loss, loss of executive function, and other cognitive abilities that interferes with daily life and loss of functional independence Prevalence increases with age, from <50% of people 71–79 y to 35%–40% of those ≥90 y	↓ Independence ↓ Adherence ↓ Shared decision-making ↓ Quality of life ↑ Hospitalization ↑ Death	Often confounds assessments of symptoms, present illness, and medical history Often confounds adherence Does not negate the potential value of therapeutic intervention, but affects the decision and implementation process
Delirium	Acute disturbance in cognition, attention, and consciousness or perception, with fluctuating course Can manifest as agitated state (hyperactive), quiet and withdrawn (hypoactive), or mixed High prevalence (≈30%–60%) in older adults who are hospitalized	↑ Length of stay ↑ Rehospitalization ↑ Functional decline ↑ Falls ↑ Long-term care ↑ Death	Prevention of delirium should take priority by optimizing the environment to increase orientation, avoid sedation, reduce medications, reduce and manage pain, avoid constipation and urinary retention Predisposing risks include cognitive deficits, sensory limitations, and disorienting medications Treat by optimizing environment to increase orientation, avoid sedation, reduce medications, reduce pain, optimize bowel and bladder function, maintain circadian rhythm and interpersonal interactions

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Polypharmacy	Use of ≥5 concurrent medications; ≥10 is considered hyperpolypharmacy May have unintended interactive effects (not required for definition) 40% of older adults take ≥5 medications	↑ Adverse events (errors and drug interactions) ↑ Falls ↑ Rehospitalizations ↑ Death	↑ Medication errors ↑ Drug–drug and drug–body interactions ↓ Adherence common Under- and overtreatment both commonly occur Consider deprescribing, with the goal to optimize prescribing, even if ≥5 drugs
Disability	Inability to care for oneself or to manage one's own lived environment independently	↑ Risk of progressive functional and cognitive decline ↓ Self-reliance and self-efficacy ↑ Long-term care ↑ Death	Conventional care for CVD often contributes to a cycle of progressive disability, which highlights rationale for shared decision-making for each aspect of therapy Conventional care for acute coronary syndrome (including pharmacotherapy, procedural care, and bed rest) can result in temporary immobility, delirium, and disturbance in sleep pattern, and increase risk of loss of independence Suboptimal transitions are common contributors to disability (eg, hospital to home, hospital to postacute care, or hospital to home if support is inadequate or patient education has been deficient)
Sensory loss	Vision, hearing, taste, touch deficits common	↑ Risk of progressive functional and cognitive decline ↓ Self-reliance and self-efficacy ↑ Long-term care ↑ Death	Same as disability

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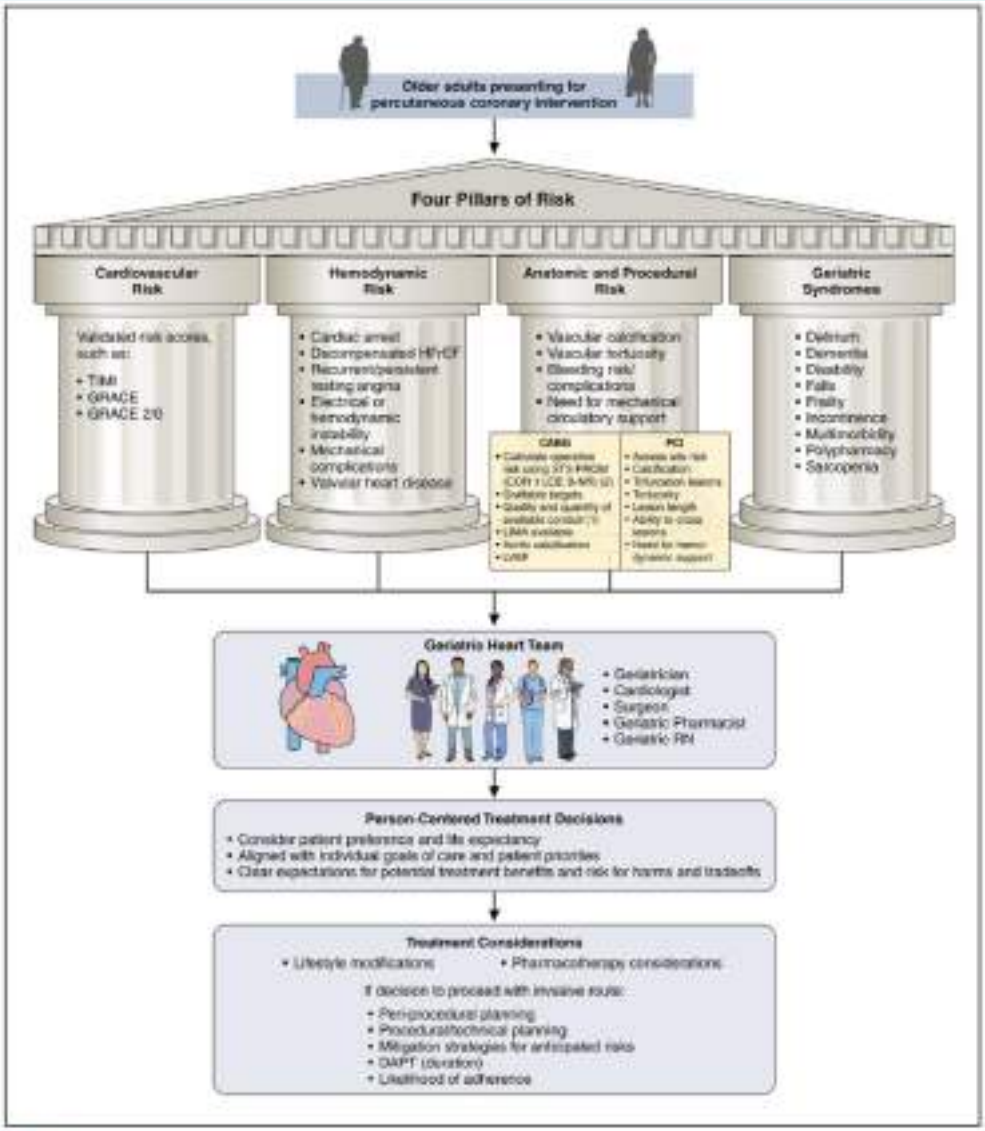

Figure 4. The 4 pillars of risk in older adults presenting for coronary revascularization procedures.
CABG indicates coronary artery bypass grafting; COR, Class of Recommendation; DAPT, dual antiplatelet therapy; GRACE, Global Registry of Acute Coronary Events; HFrEF, heart failure with reduced ejection fraction; LIMA, left internal mammary artery; LOE, Level of Evidence; LVEF, left ventricular ejection fraction; NR, nonrandomized; PCI, percutaneous coronary intervention; STS PROM, Society of Thoracic Surgeons Predicted Risk of Mortality; and TIMI, Thrombolysis in Myocardial Infarction.

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Table 5. Overview of Age-Related Pharmacokinetic and Pharmacodynamic Changes and Their Implications for Pharmacotherapy in Cardiovascular Procedures

Pharmacokinetic process	Physiologic change	Pharmacokinetic effect	Medications affected	Suggested clinical actions
Distribution	↓ Total body water, ↓ lean muscle mass, relative ↑ in body fat	Larger volume of distribution of lipophilic medications and smaller volume of distribution of hydrophilic medications	Heparin, enoxaparin	Use weight-based dosing; monitor for exaggerated effects of lipophilic agents
Metabolism	↓ Hepatic blood flow, possible ↓ in hepatic CYP450 activity	Longer duration of effect of hepatically metabolized medications	Midazolam, diazepam, opioid antagonists, diphenhydramine	Use lower initial doses; avoid long-acting benzodiazepines; monitor for sedation
Excretion	↓ Glomerular filtration rate	Longer duration of effect of renally cleared medications	Eptifibatide, tirofiban, enoxaparin, bivalirudin	Ensure renal dose adjustment; avoid agents with narrow therapeutic index in case of renal impairment
Altered receptor sensitivity	↑ Sensitivity to centrally acting agents	↓ Dose requirement for pharmacologic effect	Benzodiazepines (eg, midazolam, diazepam), opioid antagonists (eg, fentanyl, morphine), antihistamines (eg, diphenhydramine)	Prefer nonsedating options when possible; minimize dose; avoid combining CNS depressants

CNS indicates central nervous system.

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ANGIOPLASTÍA SEGÚN PRESENTACIÓN

URGENTE (IAMCEST):

- 30% de los pacientes admitidos tienen ≥ 75 años.
  - IAM en ≥ 90 años se ha duplicado de 2003-2014 (0.6-1.%).
- Se prefiere ACTP sobre trombolísis, por mayor eficacia y seguridad.
  - Menos re-infarto.
  - Menos sangrado mayor.
- > 50% de los pacientes > 80 años, presentan falla cardíaca como complicación (sistólica o diastólica).
  - > 2 veces Shock cardiogénico en ≥ 75 años vs < 75 años **(10.8% versus 3.9%).**
- Reducción sustancial de isquemia recurrente a largo plazo.
- La reducción de riesgo relativo es similar a los pacientes mas jóvenes.
- Flujo TIMI III: 86.3%
- Mortalidad a 30 días: 17.9
- Mortalidad a 1 año: 27.2%
- Mortalidad a 5 años: 41.4%

Geriatr Cardiol 2015; 12: 174−184.
Eur Heart J 2011; 32: 51–60.
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ACTP EN SCASEST

- Edad avanzada es un factor de riesgo independiente de complicaciones mayores.
- Hay pocos datos sobre este tópico, pero en el registro GRACE (18,466 pacientes), el 16% eran octogenarios y se mostró que había ventajas significativas de revascularizar a este subgrupo, en relación a :
  - Menos complicaciones en hospital:
    - ICC, isquemia recurrente, sangrado mayor, mortalidad.
  - En el estudio TACTICS-TIMI 18, se demostró una reducción del riesgo relativo de 56%, en el grupo que se trató en forma invasiva temprana.
  - El mensaje consistente en todos los estudios es que la revascularización es mejor que la terapia médica en estos pacientes.

Geriatr Cardiol 2015; 12: 174−184.
Lancet 1998; 352: 507–551.
Eur Heart J 2008; 29: 1275–1282.
Ann Intern Med 2004; 141: 186-195. Circulation. 2025;152:e494–e525.

Table 3. Revascularization Trials Specifically Including Adults ≥75 Years of Age With Acute Coronary Syndrome

Trial (year)	Study population (age, y)	Randomized intervention	Age included, y	Primary end point	Secondary end points
TACTICS-TIMI 18 (2001)	ACS (>75)	Invasive vs conservative	Mean 80	15.9% vs 19.4% for death, MI, and rehospitalization for ACS	Lower mortality and MI rates, especially in elevated troponin group
FIR (2012)	ACS, recent chest pain, troponin elevation	Invasive vs conservative	Median 76	26.1% vs 34.9% for death, MI, or refractory angina (P=0.007)	Fewer hospitalizations and sustained symptom relief over 5 y; higher bleeding rates
Italian Elderly ACS (2012)	ACS (≥75)	Invasive vs conservative	Mean 80	36% vs 53% for death, MI, stroke, or rehospitalization	Lower recurrence of angina and improved QoL
After Eighty (2016)	NSTE-ACS (≥80)	Invasive vs conservative	Median 84	40% vs 61% for MI, urgent revascularization, stroke, or death	Improved survival and symptom relief
MOSCA (2016)	NSTE-ACS, comorbidities	Invasive vs conservative	Mean 80	19.2% vs 39% for death, MI, and rehospitalization for ACS	Fewer recurrent cardiac events, long-term outcomes
80+ (2020)	NSTE-ACS, ischemic symptoms	Invasive vs conservative	Median 83	36% vs 56% for death, MI, revascularization, stroke, or rehospitalization	Improved symptom management, reduced rehospitalization
RINCAL (2021)	NSTE-ACS (≥80)	Invasive vs conservative	Median 85	24% vs 34% for death or MI	Improved overall survival and symptom relief
MOSCA-FRAIL (2023)	NSTE-ACS (≥75)	Invasive vs conservative	Mean 85	Stopped prematurely due to COVID-19; 284 vs 312 d alive out of the hospital	No difference in the co–primary end point of ischemic cardiac events (cardiac death, reinfarction, postdischarge revascularization)
SENIOR-RITA (2024)	NSTEMI (≥75)	Invasive vs conservative	Median 82	25.6% vs 26.3% for cardiovascular death or nonfatal MI	11.7% vs 15% for nonfatal MI
FIRE (2024)	ACS (≥75); multivessel CAD	Physiology-guided complete vs culprit-only	Median 81	15.7% vs 21.0% for composite of death, MI, stroke, or revascularization	Lower death, MI, ischemia-driven revascularization; improved symptom relief and QoL

ACS indicates acute coronary syndrome; CAD, coronary artery disease; FIR, FRISC II (Fragmin and Fast Revascularization During Instability in Coronary Artery Disease); FIRE, Functional Assessment in Elderly MI Patients With Multivessel Disease; MI, myocardial infarction; MOSCA, Comorbilidades en el Síndrome Coronario Agudo; MOSCA-FRAIL, Invasive and Conservative Strategies in Elderly Frail Patients With Non-STEMI; NSTE-ACS, non–ST-segment–elevation acute coronary syndrome; NSTEMI, non–ST-segment–elevation myocardial infarction; QoL, quality of life; RINCAL, Revascularisation or Medical Therapy in Elderly Patients With Acute Anginal Syndromes; SENIOR-RITA, A Study to Evaluate the Benefit of Medical Therapy versus Angiography and Stenting in Patients With Heart Attacks; and TACTICS-TIMI 18, Treat Angina With Aggrastat and Determine Cost of Therapy With an Invasive or Conservative Strategy.

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ANGIOPLASTÍA SEGÚN PRESENTACIÓN

ELECTIVA:

- Históricamente con más riesgo de complicaciones.
  - Mortalidad hospitalaria, ECV, complicaciones vasculares, IM, insuficiencia renal.
- Con el desarrollo de dispositivos y técnicas esto ha cambiado y la tasa de complicaciones es mínima con alta tasa de éxito.
  - DES de última generación.
  - Uso de técnica radial.

Geriatr Cardiol 2015; 12: 174−184.
Eur Heart J 2011; 32: 51–60.
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Table 4. Revascularization Trials Specifically Including Adults ≥75 Years of Age With Stable Ischemic Heart Disease

Trial (year)	Study population (sample size, n)	Randomized intervention	Age included, y	Specific results in older adults	Primary end point	Secondary end points
TIME (2001)	≥75 y with chronic angina with CCSC ≥II and ≥2 antianginal drugs	Revascularization (PTCA or CABG) vs medical therapy	Mean 80	All results apply specifically to older adults; all patients included in the trial were ≥75 y	QoL at 6 mo (SF-36) significantly improved with invasive strategy	All other QoL measures also improved with revascularization at 6 mo; MACEs improved with revascularization at 6 mo (19% vs 49%; P<0.0001)
COURAGE (2007)	Stable angina or silent ischemia and CAD (>70% stenosis)	PCI with OMT vs OMT alone	Mean >60; 24% of participants ≥75; unclear how many participants ≥75	Results specifically for older adult cohort not published	Death and MI at median follow-up of 4.6 y was 19% (PCI) vs 18.5% (OMT; P=0.62)	No significant differences in composite of death, MI, and stroke, hospitalization for ACS, or MI
BARI 2D (2009)	Type 2 diabetes and evidence of ischemia	Prompt revascularization (PCI or CABG) vs medical therapy	Mean >60; maximum 89.8; 160 participants ≥75	Results for patients ≥75 y not reported; results for patients ≥70 y; effect of revascularization vs medical therapy did not differ by age for death ($P_{interaction}$=0.89), major cardiovascular events, angina, or health status outcomes; health status improvement was less sustained in older vs younger patients; no difference in patients ≥65 at 5 y in QoL	5-y survival, 88.3% with revascularization vs 87.6% with medical therapy	No difference in rate of freedom from MACEs, no difference in death for the CABG or PCI strata; CABG, but not PCI, associated with fewer MACEs compared with medical therapy
PRECOMBAT (2011)	Left main CAD, >50% stable angina or no symptoms	PCI vs CABG	Mean >60; 148 participants ≥70	Included in meta-analysis of older adults (70–89 y) from CABG vs PCI trials including BEST and SYNTAX trials demonstrating CABG was associated with lower risk of all-cause mortality, MI, stroke, or repeat revascularization; consistent point estimate for benefit with CABG vs those ≥80 y in meta-analysis	PCI noninferior to CABG for MACCE (8.7% vs 6.7%); P=0.01 for noninferiority at 1 y	PCI noninferior to CABG for MACCE at 3 y; composite of death, MI, and stroke similar between PCI (4.4%) and CABG (4.7%) at 3 y
NAME 2 (2012)	Stable CAD suitable for PCI	PCI vs medical therapy	Mean 63.5; 104 participants ≥75*	Results specifically for older adult cohort not published	Composite of death, MI, or urgent revascularization (trial stopped early): 4.3% (PCI) vs 12.7% (medical therapy); P<0.001	Death or MI did not differ between groups; difference in MACE was driven by difference in urgent revascularization
FREEDOM (2012, 2016)	Diabetes and multivessel CAD with diameter stenosis ≥70% in ≥2 major epicardial vessels involving 3 separate coronary territories; ≈69% non-ACS	CABG vs PCI	Mean >60; 180 patients >75	Benefits from CABG not seen in older patients (≥63.3 y) compared with younger patients (≤63.3 y; $P_{interaction}$=0.001); treatment effect appeared consistent for angina frequency improvement with CABG at 12 and 24 mo in those >10 y	Composite of death from any cause, nonfatal MI, or nonfatal stroke was significantly higher at 5 y with PCI (26.6%) vs CABG (18.7%; P=0.004); all-cause death at median follow-up 10 y: CABG 18.8% vs PCI 24.3% (P=0.01)	CABG favored for both MI (P<0.001) and death from any cause (P=0.045); stroke more common with CABG (5.2%) vs PCI (2.4%; P=0.03)
BEST (2015)	Multivessel CAD	PCI vs CABG	294 participants ≥70	Included in meta-analysis of older adults (70–89 y) from CABG vs PCI trials including BEST and SYNTAX trials demonstrating CABG was associated with lower risk of all-cause mortality, MI, stroke, or repeat revascularization; consistent point estimate for benefit with CABG in those ≥80 y in meta-analysis	Composite of death, MI, or target vessel revascularization at 2 y was 11% (PCI) vs 7.9% (CABG); P=0.33 for noninferiority	At 4.6-y long-term follow-up, primary end point 18.8% (PCI) vs 10.6% (CABG; P=0.04); higher rates of repeat revascularization and spontaneous MI with PCI vs CABG

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Table 4. Continued

Trial (year)	Study population (sample size, n)	Randomized intervention	Age included, y	Specific results in older adults	Primary end point	Secondary end points
EXCEL (2016)	Left main coronary disease of low or intermediate anatomic complexity (>53% with stable angina)	PCI vs CABG	Mean >66; 319 participants ≥75	Results consistent in the small sample of those ≥75 y ($P_{interaction}$=0.13 for MACE at 3 y)	PCI noninferior to CABG for MACE (death, stroke, or MI) at 3 y	PCI noninferior to CABG for 30-d MACE and MACE or ischemia-driven revascularization at 3 y
STICH (2016)	CAD amenable to CABG and HFrEF (EF <35%)	CABG vs medical therapy	Median >60; 75 patients >75; patients up to age 85 were enrolled	308 patients >67 y with median age 72; trend toward attenuated benefit of CABG with increasing age on all-cause mortality ($P_{interaction}$=0.06) but consistent benefit on cardiovascular mortality across all ages	Death at >10-y follow-up 58.9% (CABG) vs 68.1% (medical therapy); P=0.02	CABG favored for multiple secondary outcomes: death from cardiovascular causes, HF, and MACE
NOBLE (2016)	Left main CAD; >85% stable angina	CABG vs PCI	Mean >68; 822 patients ≥67 (mean age 73) and 77 patients ≥80	Among older participants, MACCE was higher with PCI (35.7%) vs CABG (22.3%; P=0.0004), driven by higher rates of MI (10.8 vs 3.8%; P=0.0018) and repeat revascularization (19.5 vs 10.0%; P=0.002); significant results were not seen in the younger age group, but there was no significant interaction between age and treatment	5-y MACCE: PCI 39% vs CABG 19%; HR, 1.51 (95% CI 1.13–2.00); P=0.0044	MI: 6% vs 3% (P=0.0040); revascularization: 19% vs 10% (P=0.03); stroke: 5% vs 2% (P=0.06)
ORBITA (2018)	Stable angina with ≥70% single-vessel stenosis	PCI vs placebo procedure	Mean 66	Results specifically for older adult cohort not published	No significant difference in exercise time between PCI and a placebo procedure	No improvement in SCSC, SAQ, or EQ-5D-5L with PCI
SYNTAX (2019)	De novo 3-vessel or left main coronary artery disease or both; >57% stable angina	PCI vs CABG	Mean >66; 575 patients >70 with mean age 75.4 in that group and 94 participants ≥80	Among older participants enrolled, risk of all-cause death or MACCE at 5 y did not differ by age between PCI and CABG; higher risk of MACCE with PCI compared with CABG in younger patients does not extend to older patients	All-cause death at 10 y 26% for PCI vs 24% for CABG (P=0.069)	CABG, compared with PCI, provided a survival benefit in those with 3-vessel disease but not those with left main disease ($P_{interaction}$=0.03)
ORBITA-2 (2023)	Stable angina with ≥1 severe coronary stenosis ≥70% and evidence of ischemia	PCI vs placebo procedure	Mean 64; >465 excluded	Results specifically for older adult cohort not published	Mean angina symptom score was significantly improved at 12-wk follow-up with PCI	Greater freedom from angina and improvements in treadmill exercise time, SAQ, and EQ-5D-5L with PCI compared with placebo procedure
ISCHEMIA (2020)	Stable coronary disease and moderate or severe ischemia	Invasive vs conservative strategy	Mean 64; 695 adults ≥75 in age subanalysis	$P_{interaction}$ by age 0.008 for SAQ Summary Score; among the 695 individuals ≥75 y in age subanalysis, older adults tended to have less improvement in angina-related health status with invasive management with consistent improvement in angina frequency	MACE for invasive vs conservative: at 6 mo: 5.3% vs 3.4%; at 5 y: 16.4% vs 18.2%; HR, 0.90 (95% CI, 0.80–1.08)	Invasive strategy led to modest improvement in angina-related health status

(Continued)

Table 4. Continued

Trial (year)	Study population (sample size, n)	Randomized intervention	Age included, y	Specific results in older adults	Primary end point	Secondary end points
PREVENT (2024)	Stable coronary disease or ACS with non–flow-limiting (FFR >0.80) nonculprit vulnerable plaques by intracoronary imaging	PCI vs OMT alone	Mean ≈65; ≈1/3 of patients ≥75*	Results specifically for older adult cohort not published	Primary composite of MACE at 2 y: 0.4% (PCI) vs 3.4% (OMT); *P*=0.0003	Results consistent across components of the composite, no significant difference in serious clinical or adverse events

Trials included in the table were required to have ≥2 of the following comparator groups: medical therapy, percutaneous coronary intervention (PCI), or coronary artery bypass grafting (CABG). BARI 2D indicates Bypass Angioplasty Revascularization Investigation 2 Diabetes; BEST, Bypass Surgery Versus Everolimus-Eluting Stent Implantation for Multivessel Coronary Artery Disease; CAD, coronary artery disease; CCSC, Canadian Cardiovascular Society Classification; COURAGE, Clinical Outcomes Utilizing Revascularization and Aggressive Drug Evaluation; EF, ejection fraction; EQ-5D-5L, EuroQol 5-Dimensions 5-Levels Questionnaire; EXCEL, Evaluation of XIENCE Versus Coronary Artery Bypass Surgery for Effectiveness of Left Main Revascularization; FFR, fractional flow reserve; FREEDOM, Future Revascularization Evaluation in Patients With Diabetes Mellitus: Optimal Management of Multivessel Disease; HF, heart failure; HFrEF, heart failure with reduced ejection fraction; HR, hazard ratio; ISCHEMIA, International Study of Comparative Health Effectiveness With Medical and Invasive Approaches; MACE, major adverse cardiovascular event; MACCE, major adverse cardiac or cerebrovascular event; MI, myocardial infarction; NOBLE, PCI vs CABG in the Treatment of Unprotected Left Main Stenosis; OMT, optimal medical therapy; PRECOMBAT, Premier of Randomized Comparison of Bypass Surgery Versus Angioplasty Using Sirolimus-Eluting Stent in Patients With Left Main Coronary Artery Disease; PTCA, percutaneous transluminal coronary angioplasty; QoL, quality of life; SAQ, Seattle Angina Questionnaire; SF-36, Short Form-36 Health Survey; STICH, Surgical Treatment for Ischemic Heart Failure; SYNTAX, Synergy Between Percutaneous Coronary Intervention With Taxus and Cardiac Surgery; and TIME, Trial of Invasive versus Medical Therapy in Elderly Patients.

*Sample size of ≥75-year-old cohort for FAME-2 (Fractional Flow Reserve Versus Angiography for Multivessel Evaluation 2), ORBITA (Objective Randomised Blinded Investigation With Optimal Medical Therapy of Angioplasty in Stable Angina), ORBITA-2, and PREVENT (Preventive PCI or Medical Therapy Alone for Vulnerable Atherosclerotic Coronary Plaque) were provided by email communication with the study principal investigators.

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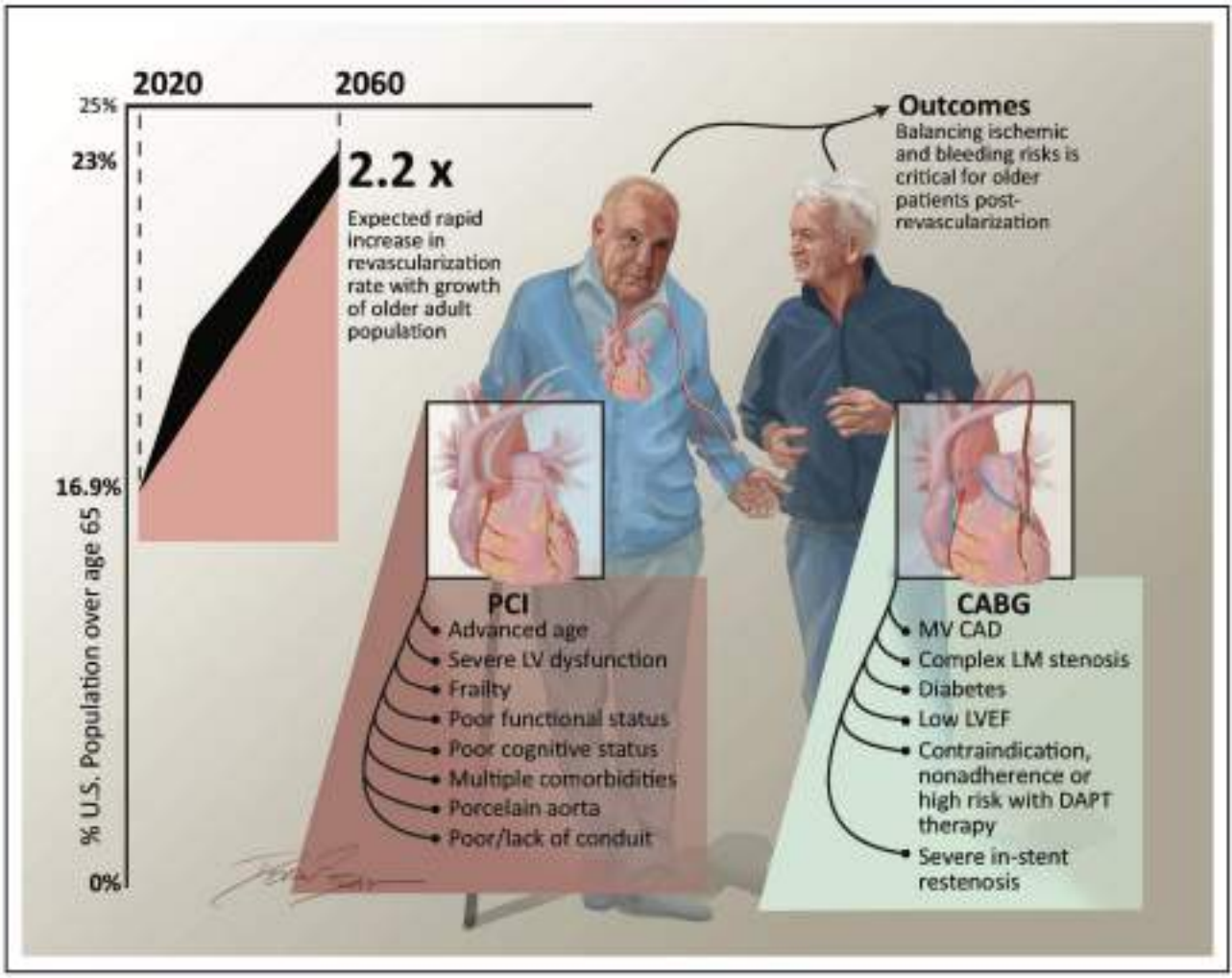

Figure 5. Choosing among coronary revascularization options.
Percutaneous coronary intervention (PCI) is often more appropriate in patients with advanced age or reduced life expectancy, severe left ventricular (LV) dysfunction, frailty, poor functional status, poor cognitive status, multiple comorbidities, severely calcified or porcelain aorta, poor bypass conduit, or lack of bypass conduit. Factors that are more appropriate for coronary artery bypass grafting (CABG) include multivessel coronary artery disease (MV CAD), complex left main (LM) stenosis, diabetes, low left ventricular ejection fraction (LVEF), contraindication to dual antiplatelet therapy (DAPT), or severe in-stent restenosis.

Circulation. 2025;152:e494–e525.

DES vs BMS

- Ventaja de DES vs BMS
  - Reducción de re-estenosis y necesidad de revascularización de lesión y vaso tratado.
- Desventajas de DES en octogenarios:
  - Mayor duración de terapia antiplaquetaria dual.
  - Mas riesgo de complicaciones por sangrado.
  - Mayor necesidad de interrupción de la terapia (cirugía no cardíaca).

Geriatr Cardiol 2015; 12: 174−184.
Am J Cardiol 2008; 101: 286–292.
Rev Esp Cardiol 2009; 62: 1250–1259.
Circulation. 2025;152:e494–e525.

DES vs BMS

- Estos factores han hecho que se utilice relativamente menos DES en octogenarios:
  - Sin embargo, un análisis de una cohorte histórica no mostró diferencias en relación al tipo de STENT en mortalidad y complicaciones a 1 año.
  - En los STENT de última generación se puede suspender la terapia. antiplaquetaria dual, luego de 1-3 meses, en pacientes con ACTP electiva.
- La re-estenosis e mayor en octogenarios que en pacientes mas jóvenes (47% vs 28%), debido a presencia de lesiones mas complejas:
  - Por esta razón debe usarse DES en estos pacientes.

Geriatr Cardiol 2015; 12: 174−184.
Am J Cardiol 2008; 101: 286–292.
Rev Esp Cardiol 2009; 62: 1250–1259.
Circulation. 2025;152:e494–e525.

SANGRADO PERI-PROCEDIMIENTO

- Es la causa más común de complicación no cardíaca en ACTP y la edad es un factor de riesgo independiente para sangrado
  - Está asociado a incremento de:
    Riesgo de muerte, IM, ECV, costos y estancia hospitalaria.
- Mecanismos de daño secundario a la pérdida de sangre:
  - Hipovolemia, hipotensión, disminución de oxígeno a tejidos, necesidad de suspender fármacos CV.
- Es pobremente tolerado en el anciano:
  - Disfunción ventricular, enfermedad vascular generalizada (rigidez vascular y disfunción endotelial).

Geriatr Cardiol 2015; 12: 174−184.
Circulation. 2025;152:e494–e525.

SANGRADO PERI-PROCEDIMIENTO

- La mayor incidencia de sangrado es debido a:
  - La presencia de más comorbilidades:
    - Aterosclerosis más extensa.
    - Hipertensión arterial sistémica.
    - Insuficiencia renal.
  - Presentación más frecuente con inestabilidad hemodinámica y shock
  - Uso de acceso femoral.
- Es muy importante estratificar el riesgo de sangrado en el anciano:
  - CRUSADE.
  - ACUITY-HORIZONS.
  - ACTION Registry-GWTG.
  - NCDR.
- Se aconseja usar acceso radial (aunque en estos pacientes hay más tortuosidad, calcificación y estenosis).

Geriatr Cardiol 2015; 12: 174−184.
Circulation 2009; 119: 1873–1882.
J Am Coll Cardiol 2010; 55: 2556–2566.
Am J Cardiol 2011; 107: 1136–1143.
Circulation. 2025;152:e494–e525.

TERAPIA ANTITROMBÓTICA

- El balance parece inclinarse a trombosis y disminución de fibrinolisis.
- Sin embargo, hay factores que incrementan el riesgo de sangrado con el uso de terapia antitrombótica:
  - Respuesta farmacodinámica y farmacocinética.
  - Interacción farmacológica por polifarmacia.
  - Comorbilidades.
- Preocupaciones más importantes:
  - Incremento del riesgo de sangrado.
  - Necesidad de utilizar anticoagulantes orales por fibrilación auricular.
  - Mayor posibilidad de cirugía no cardíaca a corto plazo.
  - Riesgo de caídas.

Geriatr Cardiol 2015; 12: 174−184.
Circulation. 2025;152:e494–e525.

TERAPIA ANTITROMBÓTICA

- Debe usarse terapia antiplaquetaria dual:
  - Aspirina 75-150 mg.
  - Clopidogrel 75 mg/d o Ticagrelor 90 mg bid.
  - Prasugrel aumenta en 32% el riesgo de sangrado en > 75 años.
  - Duración del tratamiento depende de:
    - Tipo de presentación (agudo o electivo).
    - Tipo de STENT.
    - Riesgo de sangrado.
    - Comorbilidades.
- Heparina no fraccionada/bivalirudina durante el peri-procedimiento.
- Inhibidores de GP Iib/IIIa: Beneficio no significativo (4%) y aumenta riesgo de sangrado mayor (62%).
- Es muy importante evaluar la función renal y peso del paciente, para hacer los ajustes de dosis necesarios.

Geriatr Cardiol 2015; 12: 174−184.
Lancet 2002; 359: 189–198.
Circulation. 2025;152:e494–e525.

CONCLUSIONES

- La frecuencia de pacientes octogenarios que requieren ACTP continua en aumento.
- El abordaje transradial es una alternativa para reducir complicaciones de sangrado (a 30 días).
- La terapia antitrombótica (tipo y duración), debe ajustarse en base a riesgo individual.
- ACTP con DES es mejor que BMS.
- ACTP mejora el pronóstico y calidad de vida de nuestros pacientes octogenarios.