

References

- Kusumoto FM, Goldschlager N. Cardiac pacing. *N Engl J Med* 1996;**334**: 89–97.
- Jeffrey K, Parsonnet V. Cardiac pacing, 1960–1985: a quarter century of medical and industrial innovation. *Circulation* 1998;**97**:1978–1991.
- Trohan RG, Kim MH, Pinski SL. Cardiac pacing: the state of the art. *Lancet* 2004;**364**:1701–1719.
- Luderitz B. We have come a long way with device therapy: historical perspectives on antiarrhythmic electrotherapy. *J Cardiovasc Electrophysiol* 2002;**13**(Suppl. 1):S2–S8.
- Elmqvist R, Senning Å. Implantable pacemaker for the heart. In: Smyth CN, ed. *Medical Electronics. Proceedings of the Second International Conference on Medical Electronics*, Paris, 24–27 June 1959. London, UK: Iliffe & Sons; 1960. p253–254. (Abstract).
- Ferrer I. *The Sick Sinus Syndrome*. Mt Kisco, NY: USA Futura Publishing Inc.; 1974.
- Fairfax AJ, Lambert CD, Leatham A. Systemic embolism in chronic sinoatrial disorder. *New Engl J Med* 1976;**295**:1455–1458.
- Sanchez-Quintana D, Cabrera JA, Farre J, Climent V, Anderson RH, Ho SY. Sinus node revisited in the era of electroanatomical mapping and catheter ablation. *Heart* 2005;**91**:189–194.
- Brignole M, Menozzi C, Gianfranchi L *et al.* Neurally mediated syncope detected by carotid sinus massage and head-up tilt test in sick sinus syndrome. *Am J Cardiol* 1991;**68**:1032–1036.
- Abbott JA, Hirschfield DS, Kunkel FW *et al.* Graded exercise testing in patients with sinus node dysfunction. *Am J Med* 1977;**62**:330–338.
- Holden W, McAnulty JH, Rahimtoola SH. Characterization of heart rate response to exercise in the sick sinus syndrome. *Br Heart J* 1978;**20**: 923–930.
- Rubenstein JJ, Schulman CL, Yurchak PM *et al.* Clinical spectrum of the sick sinus syndrome. *Circulation* 1972;**46**:5–13.
- Hartel G, Talvensaari T. Treatment of sinoatrial syndrome with permanent cardiac pacing in 90 patients. *Acta Med Scand* 1975;**198**:341–377.
- Skagen K, Fischer Hansen J. The long term prognosis for patients with sinoatrial block treated with permanent pacemaker. *Acta Med Scand* 1976;**199**:13–15.
- Kay R, Estioko M, Wiener I. Primary sick sinus syndrome as an indication for chronic pacemaker therapy in young adults: incidence, clinical features, and long-term evaluation. *Am Heart J* 1982;**103**:338–342.
- Albin G, Hayes DL, Holmes DR Jr. Sinus node dysfunction in pediatric and young adult patients: treatment by implantation of a permanent pacemaker in 39 cases. *Mayo Clin Proc* 1985;**60**:667–672.
- Shaw DB, Holman RR, Gowers JI. Survival in sinoatrial disorder (sick-sinus syndrome). *Br Med J* 1980;**280**:139–141.
- Rasmussen K. Chronic sinus node disease: natural course and indications for pacing. *Eur Heart J* 1981;**2**:455–459.
- Lichstein E, Aithal H, Jonas S *et al.* Natural history of severe sinus bradycardia discovered by 24 hour Holter monitoring. *Pacing Clin Electrophysiol* 1982;**5**:185–189.
- Fuster V, Ryden LE, Cannom DS *et al.* ACC/AHA/ESC 2006 guidelines for the management of patients with atrial fibrillation: a report of the American College of Cardiology/American Heart Association Task Force on practice guidelines, the European Society of Cardiology Committee for Practice Guidelines (Writing Committee to Revise the 2001 guidelines for the management of patients with atrial fibrillation) developed in collaboration with the European Heart Rhythm Association, the Heart Rhythm Society. *Europace* 2006;**8**:651–745.
- Andersen HR, Thuesen L, Bagger JP *et al.* Prospective randomized trial of atrial versus ventricular pacing in sick sinus syndrome. *Lancet* 1994;**344**:1523–1528.
- Lamas GA, Orav EJ, Stambler BS *et al.* Pacemaker Selection in the Elderly Investigators: quality of life and clinical outcomes in elderly patients treated with ventricular pacing as compared with dual-chamber pacing. *N Engl J Med* 1998;**338**:1097–1104.
- Connolly SJ, Kerr CR, Gent M *et al.* Effects of physiologic pacing versus ventricular pacing on the risk of stroke and death due to cardiovascular causes. *N Engl J Med* 2000;**342**:1385–1391.
- Lamas GA, Lee KL, Sweeney MO *et al.*, for the Mode Selection Trial in Sinus-Node Dysfunction. Ventricular pacing or dual-chamber pacing for sinus-node dysfunction. *N Engl J Med* 2002;**346**:1854–1862.
- Nielsen JC, Kristensen L, Andersen HR *et al.* A randomized comparison of atrial and dual-chamber pacing in 177 consecutive patients with sick sinus syndrome: echocardiographic and clinical outcome. *J Am Coll Cardiol* 2003;**42**:614–623.
- Padeletti L, Purefellner H, Adler SW *et al.*, Worldwide ASPECT Investigators. Combined efficacy of atrial septal lead placement and atrial pacing algorithms for prevention of paroxysmal atrial tachyarrhythmia. *J Cardiovasc Electrophysiol* 2003;**14**:1189–1195.
- Mitchell ARJ, Sulke N. How do atrial pacing algorithms prevent atrial arrhythmias? *Europace* 2004;**6**:351–362.
- Israel CW, Hohnloser SH. Pacing to prevent atrial fibrillation. *J Cardiovasc Electrophysiol* 2003;**14**:S20–S26.
- Carlson M, Ip J, Messenger J, Beau S *et al.*, Atrial Dynamic Overdrive Pacing Trial [ADOPT] Investigators. A new pacemaker algorithm for the treatment of atrial fibrillation: results of the Atrial Overdrive Pacing Trial [ADOPT]. *J Am Coll Cardiol* 2003;**42**:627–633.
- Lee MA, Weachter R, Pollak S *et al.*, ATTEST Investigators. The effect of atrial pacing therapies on atrial tachyarrhythmia burden and frequency: a randomized trial in patients with bradycardia and atrial tachyarrhythmias. *J Am Coll Cardiol* 2003;**41**:1926–1932.
- Knight BP, Gersh BJ, Carlson MD *et al.* Role of permanent pacing to prevent atrial fibrillation: science advisory from the American Heart Association Council on Clinical Cardiology [Subcommittee on Electrocardiography and Arrhythmias] and the Quality of Care and Outcomes Research Interdisciplinary Working Group, in collaboration with the Heart Rhythm Society. *Circulation* 2005;**111**:240–243.
- Connolly SJ, Kerr C, Gent M *et al.* Dual-chamber versus ventricular pacing. Critical appraisal of current data. *Circulation* 1996;**94**:578–583.
- Rinfret S, Cohen DJ, Lamas GA *et al.* Cost-effectiveness of dual-chamber pacing compared with ventricular pacing for sinus node dysfunction. *Circulation* 2005;**111**:165–172.
- Dretzke J, Toff WD, Lip GYH, Raftery J, Fry-Smith A, Taylor R. Dual chamber versus single chamber ventricular pacemakers for sick sinus syndrome and atrioventricular block. *Cochrane Database of Systematic Reviews* 2004, 2, Art. no. CD003710.
- Kristensen L, Nielsen JC, Pedersen AK, Mortensen PT, Andersen HR. AV block and changes in pacing mode during long-term follow-up of 399 consecutive patients with sick sinus syndrome treated with an AAI/AAIR pacemaker. *Pacing Clin Electrophysiol* 2001;**24**:358–365.
- Brandt J, Anderson H, Fahraeus T, Schuller H. Natural history of sinus node disease treated with atrial pacing in 213 patients: implications for selection of stimulation mode. *J Am Coll Cardiol* 1992;**20**:633–639.
- Freidberg CK, Donoso E, Stein WG. Nonsurgical acquired heart block. *Ann N Y Acad Sci* 1964;**111**:835.
- Gadbois HL, Wisoff BG, Litwak RS. Surgical treatment of complete heart block: an analysis of 36 cases. *JAMA* 1964;**189**:97.
- Johansson BW. Complete heart block: a clinical, hemodynamic and pharmacological study in patients with and without an artificial pacemaker. *Acta Med Scand* 1966;**180**(Suppl. 451):1.
- Hindman MC, Wagner GS, JaRo M *et al.* The clinical significance of bundle branch block complicating acute myocardial infarction: indications for temporary and permanent pacemaker insertion. *Circulation* 1978;**58**:689–699.
- Donmoyer TL, DeSanctis RW, Austen WG. Experience with implantable pacemakers using myocardial electrodes in the management of heart block. *Ann Thorac Surg* 1967;**3**:218.

42. Edhag O, Swahn A. Prognosis of patients with complete heart block or arrhythmic syncope who were not treated with artificial pacemakers: a long-term follow up study of 101 patients. *Acta Med Scand* 1976; **200**:457–463.
43. Strasberg B, Amat-Y-Leon F, Dhingra RC *et al.* Natural history of chronic second-degree atrioventricular nodal block. *Circulation* 1981; **63**: 1043–1049.
44. Connelly DT, Steinhaus DM. Mobitz type I atrioventricular block: an indication for permanent pacing? *Pacing Clin Electrophysiol* 1996; **19**: 261–264.
45. Shaw DB, Gowers JI, Kekwick CA, New KHJ, Whistance AWT. Is Mobitz type I atrioventricular block benign in adults? *Heart* 2004; **90**:169–174.
46. Donoso E, Adler LN, Friedberg CK. Unusual forms of second degree atrioventricular block, including Mobitz type-II block, associated with the Morgagni-Adams-Stokes syndrome. *Am Heart J* 1964; **67**:150–157.
47. Ranganathan N, Dhurandhar R, Phillips JH *et al.* His bundle electrogram in bundle-branch block. *Circulation* 1972; **45**:282–294.
48. Barold SS. Indications for permanent cardiac pacing in first degree AV block: class I, II, or III? *Pacing Clin Electrophysiol* 1996; **19**:747–751.
49. Kim YH, O'Nunain S, Trouton T *et al.* Pseudopacemaker syndrome following inadvertent fast pathway ablation for atrioventricular nodal reentrant tachycardia. *J Cardiovasc Electrophysiol* 1993; **4**:178–182.
50. Chokshi SK, Sarmiento J, Nazari J *et al.* Exercise-provoked distal atrioventricular block. *Am J Cardiol* 1990; **66**:114–116.
51. Barold SS, Falkoff MD, Ong LS *et al.* Atrioventricular block: new insights. In: Barold SS, Mugica J, eds. *New Perspectives in Cardiac Pacing*. Mount Kisco, NY: Futura Publishing Co.; 1991. p23–52.
52. Perloff JK, Stevenson WG, Roberts NK *et al.* Cardiac involvement in myotonic muscular dystrophy (Steinert's disease): a prospective study of 25 patients. *Am J Cardiol* 1984; **54**:1074–1081.
53. Hiromasa S, Ikeda T, Kubota K *et al.* Myotonic dystrophy: ambulatory electrocardiogram, electrophysiologic study, and echocardiographic evaluation. *Am Heart J* 1987; **113**:1482–1488.
54. Stevenson WG, Perloff JK, Weiss JN *et al.* Facioscapulohumeral muscular dystrophy: evidence for selective, genetic electrophysiologic cardiac involvement. *J Am Coll Cardiol* 1990; **15**:292–299.
55. James TN, Fisch C. Observations on the cardiovascular involvement in Friedreich's ataxia. *Am Heart J* 1963; **66**:164–175.
56. Roberts NK, Perloff JK, Kark RAP. Cardiac conduction in the Kearns-Sayre syndrome (a neuromuscular disorder associated with progressive external ophthalmoplegia and pigmentary retinopathy): report of 2 cases and review of 17 published cases. *Am J Cardiol* 1979; **44**: 1396–1400.
57. Charles R, Holt S, Kay JM *et al.* Myocardial ultrastructure and the development of atrioventricular block in Kearns-Sayre syndrome. *Circulation* 1981; **63**:214–219.
58. James TN. Observations on the cardiovascular involvement, including the conduction system, in progressive muscular dystrophy. *Am Heart J* 1962; **63**:48–56.
59. Gallagher JJ, Svenson RH, Kasell JH *et al.* Catheter technique for closed-chest ablation of the atrioventricular conduction system. *N Engl J Med* 1982; **306**:194–200.
60. Langberg JJ, Chin MC, Rosenqvist M *et al.* Catheter ablation of the atrioventricular junction with radiofrequency energy. *Circulation* 1989; **80**: 1527–1535.
61. Kim MH, Deeb GM, Eagle KA *et al.* Complete atrioventricular block after valvular heart surgery and the timing of pacemaker implantation. *Am J Cardiol* 2001; **87**:649–651.
62. Schneider JF, Thomas HE, Kreger BE *et al.* Newly acquired left bundle branch block: the Framingham Study. *Ann Intern Med* 1979; **90**:303–310.
63. Schneider JF, Thomas HE, Kreger BE *et al.* Newly acquired right bundle branch block: the Framingham Study. *Ann Intern Med* 1980; **92**:37–44.
64. Eriksson P, Hansson PO, Eriksson H, Dellborg M. Bundle-branch block in a general male population: the study of men born 1913. *Circulation* 1998; **98**:2494–2500.
65. Dhingra RC, Palileo E, Strasberg B *et al.* Significance of the HV interval in 517 patients with chronic bifascicular block. *Circulation* 1981; **64**: 1265–1271.
66. McNulty JH, Rahimtoola SH, Murphy E *et al.* Natural history of 'high risk' bundle branch block: final report of a prospective study. *N Engl J Med* 1982; **307**:137–143.
67. Scheinman MM, Peters RW, Morady F *et al.* Electrophysiological studies in patients with bundle branch block. *PACE* 1983; **6**:1157–1165.
68. McNulty JH, Rahimtoola SH. Bundle branch block. *Prog Cardiovasc Dis* 1984; **26**:333–354.
69. Dhingra RC, Denes P, Wu D *et al.* Syncope in patients with chronic bifascicular block: significance, causative mechanisms and clinical implications. *Ann Intern Med* 1974; **81**:302–306.
70. Wiberg TA, Richman HG, Gobel FL. The significance and prognosis of chronic bifascicular block. *Chest* 1977; **71**:329–334.
71. Scheinman MM, Peters RW, Sauve MJ *et al.* Value of the H-Q interval in patients with bundle branch block and the role of prophylactic permanent pacing. *Am J Cardiol* 1982; **50**:1316–1322.
72. Englund A. Electrophysiological studies in patients with bifascicular block. Thesis, Karolinska Institute, Stockholm.
73. Rosen KM, Rahimtoola SH, Chuquimia R *et al.* Electrophysiological significance of first degree atrioventricular block with intraventricular conduction disturbance. *Circulation* 1971; **43**:491–502.
74. Dhingra RC, Wyndham C, Bauernfeind R *et al.* Significance of block distal to the His bundle induced by atrial pacing in patients with chronic bifascicular block. *Circulation* 1979; **60**:1455–1464.
75. Petrac D, Radic B, Birtic K *et al.* Block induced by atrial pacing in the presence of chronic bundle branch block. *Pacing Clin Electrophysiol* 1996; **19**:784–792.
76. Peters RW, Scheinman MM, Modin C *et al.* Prophylactic permanent pacemakers for patients with chronic bundle branch block. *Am J Med* 1979; **66**:978–985.
77. Gronda M, Magnani A, Occhetta E *et al.* Electrophysiologic study of atrioventricular block and ventricular conduction defects. Prognostic and therapeutic implications. *G Ital Cardiol* 1984; **14**:768–773.
78. Ezri M, Lerman BB, Marchlinski FE *et al.* Electrophysiologic evaluation of syncope in patients with bifascicular block. *Am Heart J* 1983; **106**: 693–697.
79. Twidale N, Heddle WF, Ayres BF *et al.* Clinical implications of electrophysiology study findings in patients with chronic bifascicular block and syncope. *Aust N Z J Med* 1988; **18**:841–847.
80. Brignole M, Menozzi C, Moya A *et al.*, International Study on Syncope of Uncertain Etiology (ISSUE) Investigators. Mechanism of syncope in patients with bundle branch block and negative electrophysiological test. *Circulation* 2001; **104**:2045–2050.
81. Connolly SJ, Kerr CR, Gent M *et al.*, the Canadian Trial of Physiological Pacing (CTOPP) Investigators. Effects of physiologic pacing versus ventricular pacing on the risk of stroke, death due to cardiovascular causes. *N Engl J Med* 2000; **342**:1385–1391.
82. Kerr C, Connolly SJ, Abdollah H, Tang AS, Talajic M, Klein GJ, Newman DM *et al.*, the Canadian Trial of Physiological Pacing (CTOPP) Investigators. Effects of physiological pacing during long-term follow-up. *Circulation* 2004; **109**:357–362.
83. Tang AS, Roberts RS, Kerr C *et al.*, the Canadian Trial of Physiologic Pacing (CTOPP) Investigators. Relationship between pacemaker dependency, the effect of pacing mode on cardiovascular outcomes. *Circulation* 2001; **103**:3081–3085.
84. Lamas GA, Orav EJ, Stambler BS *et al.*, the Pacemaker Selection in the Elderly Investigators. Quality of life, clinical outcomes in elderly patients treated with ventricular pacing as compared with dual-chamber pacing. *N Engl J Med* 1998; **338**:1097–1104.
85. Toff WD, Camm J, Skehan D *et al.*, the United Kingdom Pacing, Cardiovascular Events (UKPACE) Trial Investigators. Single-chamber versus dual-chamber pacing for high-grade atrioventricular block. *N Engl J Med* 2005; **353**:145–155.
86. Huang M, Krahn AD, Yee R *et al.* Optimal pacing for symptomatic AV block: a comparison of VDD and DDD pacing. *Pacing Clin Electrophysiol* 2004; **27**:19–23.
87. Wiegand UK, Potratz J, Bode F *et al.* Cost-effectiveness of dual-chamber pacemaker therapy: does single lead VDD pacing reduce treatment costs of atrioventricular block? *Eur Heart J* 2001; **22**:174–180.
88. Wiegand UK, Bode F, Schneider R *et al.* Atrial sensing and AV synchrony in single lead VDD pacemakers: a prospective comparison to DDD devices with bipolar atrial leads. *J Cardiovasc Electrophysiol* 1999; **10**:513–520.
89. Wiegand UK, Bode F, Schneider R *et al.* Development of sinus node disease in patients with AV block: implications for single lead VDD pacing. *Heart* 1999; **81**:580–585.
90. Wilkoff BL, Cook JR, Epstein AE *et al.*, Dual Chamber, VVI Implantable Defibrillator Trial Investigators. Dual-chamber pacing or ventricular backup pacing in patients with an implantable defibrillator: the Dual Chamber and VVI Implantable Defibrillator (DAVID) Trial. *JAMA* 2002; **288**:3115–3123.
91. Hoijer CJ, Meurling C, Brandt J. Upgrade to biventricular pacing in patients with conventional pacemakers and heart failure: a double-blind, randomized crossover study. *Europace* 2006; **8**:51–55.

92. Witte KK, Pipes RR, Nanthakumar K *et al.* Biventricular pacemaker upgrade in previously paced heart failure patients—improvements in ventricular dyssynchrony. *J Card Fail* 2006;12:199–204.
93. Kindermann M, Hennen B, Jung J *et al.* Biventricular versus conventional right ventricular stimulation for patients with standard pacing indication and left ventricular dysfunction. *J Am Coll Cardiol* 2006;47:1927–1937.
94. Wiggers CJ. The muscle reactions of the mammalian ventricles to artificial surface stimuli. *Am J Physiol* 1925;73:346–378.
95. Adomian GE, Beazell J. Myofibrillar disarray produced in normal hearts by chronic electrical pacing. *Am Heart J* 1986;112:79–83.
96. Boucher CA, Pohost GM, Okada RD *et al.* Effect of ventricular pacing on left ventricular function assessed by radionuclide angiography. *Am Heart J* 1983;106:1105–1111.
97. Tantengco MV, Thomas RL, Karpawich PP. Left ventricular dysfunction after long-term right ventricular apical pacing in the young. *J Am Coll Cardiol* 2001;37:2093–2100.
98. Thambo JB, Bordachar P, Garrigue S *et al.* Detrimental ventricular remodeling in patients with congenital complete heart block and chronic right ventricular apical pacing. *Circulation* 2005;110:3766–3772.
99. Nahlawi M, Waligora M, Spies SM *et al.* Left ventricular function during and after right ventricular pacing. *J Am Coll Cardiol* 2004;44:1883–1888.
100. Tse H-F, Yu C, Wong K-K *et al.* Functional abnormalities in patients with permanent right ventricular pacing. *J Am Coll Cardiol* 2002;40:1451–1458.
101. Simantirakis EN, Prassopoulos VK, Chrysostomakis SI *et al.* Effects of asynchronous ventricular activation on myocardial adrenergic innervation in patients with permanent dual-chamber pacemakers: an I(123)-metaiodobenzylguanidine cardiac scintigraphic study. *Eur Heart J* 2001;22:323–332.
102. Victor F, Leclercq C, Mabo P *et al.* Optimal right ventricular pacing site in chronically implanted patients: a prospective randomized crossover comparison of apical and outflow tract pacing. *J Am Coll Cardiol* 1999;33:311–316.
103. Schwaab B, Frohlig G, Alexander C *et al.* Influence of right ventricular stimulation site on left ventricular function in atrial synchronous ventricular pacing. *J Am Coll Cardiol* 1999;33:317–323.
104. Buckingham TA, Candinas R, Attenhofer C *et al.* Systolic and diastolic function with alternate and combined site pacing in the right ventricle. *Pacing Clin Electrophysiol* 1998;21:1077–1084.
105. Kolettis TM, Kyriakides ZS, Tsiapras D *et al.* Improved left ventricular relaxation during short-term right ventricular outflow tract compared to apical pacing. *Chest* 2000;117:60–64.
106. Buckingham TA, Candinas R, Schlappfer J *et al.* Acute hemodynamic effects of atrioventricular pacing at differing sites in the right ventricle individually and simultaneously. *Pacing Clin Electrophysiol* 1997;20:909–915.
107. Karpawich PP, Mital S. Comparative left ventricular function following atrial, septal, and apical single chamber heart pacing in the young. *Pacing Clin Electrophysiol* 1997;20:1983–1988.
108. Giudici MC, Thornburg GA, Buck DL *et al.* Comparison of right ventricular outflow tract and apical lead permanent pacing on cardiac output. *Am J Cardiol* 1997;79:209–212.
109. Mera F, DeLurgio DB, Patterson RE *et al.* A comparison of ventricular function during high right ventricular septal and apical pacing after His-bundle ablation for refractory atrial fibrillation. *Pacing Clin Electrophysiol* 1999;22:1234–1239.
110. de Cock CC, Giudici MC, Twisk JW. Comparison of the haemodynamic effects of right ventricular outflow-tract pacing with right ventricular apex pacing: a quantitative review. *Europace* 2003;5:275–278.
111. Stambler BS, Ellenbogen K, Zhang X *et al.*, ROVA Investigators. Right ventricular outflow versus apical pacing in pacemaker patients with congestive heart failure and atrial fibrillation. *J Cardiovasc Electrophysiol* 2003;14:1180–1186.
112. Occhetta E, Bortnik M, Magnani A *et al.* Prevention of ventricular desynchronization by permanent para-hisian pacing after atrioventricular node ablation in chronic atrial fibrillation: a crossover, blinded, randomized study versus apical right ventricular pacing. *J Am Coll Cardiol* 2006;47:1938–1945.
113. Simantirakis EN, Vardakis KE, Kochiadakis GE *et al.* Left ventricular mechanics during right ventricular apical or left ventricular-based pacing in patients with chronic atrial fibrillation after atrioventricular junction ablation. *J Am Coll Cardiol* 2004;43:1013–1018.
114. Victor F, Mabo P, Mansour H, Pavin D, Kabalu G, de Place C, Leclercq C, Daubert JC. A randomized comparison of permanent septal pacing versus apical right ventricular pacing. *J Cardiovasc Electrophysiol* 2006;17:1–5.
115. Harpaz D, Behar S, Gottlieb S *et al.*, SPRINT Study Group, the Israeli Thrombolytic Survey Group. Secondary Prevention Reinfarction Israeli Nifedipine Trial. Complete atrioventricular block complicating acute myocardial infarction in the thrombolytic era. *J Am Coll Cardiol* 1999;34:1721–1728.
116. Wong CK, Stewart RAH, Gao W *et al.* Prognostic differences between different types of bundle branch block during the early phase of acute myocardial infarction: insights from the Hirulog and Early Reperfusion or Occlusion (HERO)-2 trial. *Eur Heart J* 2006;27:21–28.
117. Goldberg RJ, Zevallos JC, Yarzebski J *et al.* Prognosis of acute myocardial infarction complicated by complete heart block: the Worcester Heart Attack Study. *Am J Cardiol* 1992;69:1135–1141.
118. Hindman M, Wagner GS, JaRo M *et al.* The clinical significance of bundle branch block complicating acute myocardial infarction. 1. Clinical characteristics, hospital mortality and one year follow-up. *Circulation* 1978;58:679–688.
119. Meine TJ, Al-Khatib SM, Alexander JH *et al.* Incidence, predictors, and outcomes of high-degree atrioventricular block complication acute myocardial infarction treated with thrombolytic therapy. *Am Heart J* 2005;149:670–674.
120. Clemmensen P, Bates ER, Califf RM *et al.* Complete atrioventricular block complicating inferior wall acute myocardial infarction treated with reperfusion therapy. *Am J Cardiol* 1991;67:225–230.
121. Berger PB, Ruocco NA, Ryan TJ *et al.* Incidence and prognostic implications of heart block complicating inferior myocardial infarction treated with thrombolytic therapy: results from TIMI II. *J Am Coll Cardiol* 1992;20:533–540.
122. Newby KH, Pisano E, Krucoff MW *et al.* Incidence and clinical relevance of the occurrence of bundle-branch block in patients treated with thrombolytic therapy. *Circulation* 1996;94:2424–2428.
123. Behar S, Zissman E, Zion M *et al.* Complete atrioventricular block complicating inferior acute wall myocardial infarction: short- and long-term prognosis. *Am Heart J* 1993;125:1622–1627.
124. Zimetbaum PJ, Josephson ME. Use of the electrocardiogram in acute myocardial infarction. *N Engl J Med* 2003;348:933–940.
125. Ginks WR, Sutton R, Oh W *et al.* Long-term prognosis after acute anterior infarction with atrioventricular block. *Br Heart J* 1977;39:186–189.
126. Domenighetti G, Perret C. Intraventricular conduction disturbances in acute myocardial infarction: short- and long-term prognosis. *Eur J Cardiol* 1980;11:51–59.
127. Behar S, Zissman E, Zion M *et al.* Prognostic significance of second-degree atrioventricular block in inferior wall acute myocardial infarction. *Am J Cardiol* 1993;72:831–834.
128. Col JJ, Weinberg SL. The incidence and mortality of intraventricular conduction defects in acute myocardial infarction. *Am J Cardiol* 1972;29:344–350.
129. Brignole M, Alboni P, Benditt D *et al.* Guidelines on management (diagnosis and treatment) of syncope—update 2004. *Europace* 2004;6:467–537.
130. Moss AJ, Glaser W, Topol E. Atrial tachypacing in the treatment of a patient with primary orthostatic hypotension. *N Engl J Med* 1980;302:1456–1457.
131. Goldberg MR, Robertson RM, Robertson D. Atrial tachypacing for primary orthostatic hypotension. *N Engl J Med* 1980;303:885–886.
132. Kristinsson A. Programmed atrial pacing for orthostatic hypotension. *Acta Med Scand* 1983;214:79–83.
133. Weissman P, Chin MT, Moss AJ. Cardiac tachypacing for severe refractory idiopathic orthostatic hypotension. *Ann Intern Med* 1992;116:650–651.
134. Grubb BP, Wolfe DA, Samoil D *et al.* Adaptive rate pacing controlled by right ventricular preejection interval for severe refractory orthostatic hypotension. *Pacing Clin Electrophysiol* 1993;16:801–805.
135. Roskam J. Un syndrome nouveau: syncopes cardiaques graves et syncopes répétées par hyperréflexivité sinocarotidienne. *Presse Med* 1930;38:590–591.
136. Weiss S, Baker J. The carotid sinus reflex in health and disease: its role in the causation of fainting and convulsions. *Medicine* 1933;12:297–354.
137. Thomas JE. Hyperactive carotid sinus reflex and carotid sinus syncope. *Mayo Clin Proc* 1969;44:127–139.
138. Blanc JJ, L'héveder G, Mansourati J *et al.* Assessment of a newly recognized association: carotid sinus hypersensitivity and denervation of sternocleidomastoid muscles. *Circulation* 1997;95:2548–2551.

139. Mc Intosh SJ, Lawson J, Kenny RA. Clinical characteristics of vasodepressor, cardioinhibitory and mixed carotid sinus syndrome in the elderly. *Am J Med* 1993;95:203–208.
140. Parry SW, Richardson D, O'Shea D *et al.* Diagnosis of carotid sinus hypersensitivity in older adults: carotid sinus massage in the upright position is essential. *Heart* 2000;83:22–23.
141. Voss DM. Demand pacing and carotid sinus syncope. *Am Heart J* 1970;79:544–547.
142. Von Maur K, Nelson EW, Holsinger JW *et al.* Hypersensitive carotid syndrome treated by implantable demand cardiac pacemaker. *Am J Cardiol* 1972;29:109–110.
143. Madigan NP, Flaker GC, Curtis JJ *et al.* Carotid sinus hypersensitivity: beneficial effects of dual-chamber pacing. *Am J Cardiol* 1984;53:1034–1040.
144. Morley CA, Perrins EJ, Grant PL *et al.* Carotid sinus syncope treated by pacing. Analysis of persistent symptoms and role of atrioventricular sequential pacing. *Br Heart J* 1982;47:411–418.
145. Blanc JJ, Bosch J, Penther Ph. Hypersensibilité sino-carotidienne. Evolution à moyen terme en fonction du traitement et de ses symptômes. *Arch Mal Cœur* 1984;77:330–336.
146. Brignole M, Menozzi C, Lolli G *et al.* Long-term outcome of paced and non paced patients with severe carotid sinus syndrome. *Am J Cardiol* 1992;69:1039–1043.
147. Menozzi C, Brignole M, Lolli G *et al.* Follow-up of asystolic episodes in patients with cardioinhibitory, neurally mediated syncope and VVI pacemaker. *Am J Cardiol* 1993;72:1152–1155.
148. Sugrue DD, Gersh BJ, Holmes DR *et al.* Symptomatic 'isolated' carotid sinus hypersensitivity: natural history and results of treatment with anticholinergic drugs or pacemaker. *J Am Coll Cardiol* 1986;7:158–162.
149. Brignole M, Menozzi C, Lolli G *et al.* Validation of a method for choice of pacing mode in carotid sinus syndrome with or without sinus bradycardia. *Pacing Clin Electrophysiol* 1991;14:196–203.
150. Brignole M, Sartore B, Barra M *et al.* Is DDD superior to VVI pacing in mixed carotid sinus syndrome? An acute and medium-term study. *Pacing Clin Electrophysiol* 1988;11:1902–1910.
151. Blanc JJ, Cazeau S, Ritter P *et al.* Carotid sinus syndrome: acute hemodynamic evaluation of a dual chamber pacing mode. *Pacing Clin Electrophysiol* 1995;18:1902–1908.
152. Ammirati F, Colivicchi F, Santini M. Diagnosing syncope in the clinical practice. Implementation of a simplified diagnostic algorithm in a multicentre prospective trial—the OESIL 2 study (Osservatorio Epidemiologico della Sincope nel Lazio). *Eur Heart J* 2000;21:935–940.
153. Blanc JJ, L'Her C, Touiza A *et al.* Prospective evaluation and outcome of patients admitted for syncope over 1 year period. *Eur Heart J* 2002;23:815–820.
154. Disertori M, Brignole M, Menozzi C *et al.* Management of syncope referred for emergency to general hospitals. *Europace* 2003;5:283–291.
155. Moya A, Permanyer-Miralda G, Sagrista-Sauleda J *et al.* Limitations of head-up tilt test for evaluating the efficacy of therapeutic interventions in patients with vasovagal syncope: results of a controlled study of etilefrine versus placebo. *J Am Coll Cardiol* 1995;25:65–69.
156. Morillo CA, Leitch JW, Yee R *et al.* A placebo-controlled trial of intravenous and oral disopyramide for prevention of neurally mediated syncope induced by head-up tilt. *J Am Coll Cardiol* 1993;22:1843–1848.
157. Raviele A, Brignole M, Sutton R *et al.* Effect of etilefrine in preventing syncopal recurrence in patients with vasovagal syncope: a double-blind, randomized, placebo-controlled trial. The Vasovagal Syncope International Study. *Circulation* 1999;99:1452–1457.
158. Moya A, Brignole M, Menozzi C *et al.* Mechanism of syncope in patients with isolated syncope and in patients with tilt-positive syncope. *Circulation* 2001;104:1261–1267.
159. Benditt DG, Fahy GJ, Lurie KG *et al.* Pharmacotherapy of neurally mediated syncope. *Circulation* 1999;100:1242–1248.
160. Brignole M. Randomized clinical trials of neurally mediated syncope. *J Cardiovasc Electrophysiol* 2003;14:564–569.
161. Fitzpatrick A, Theodorakis G, Ahmed R *et al.* Dual chamber pacing aborts vasovagal syncope induced by 60 degree tilt. *Pacing Clin Electrophysiol* 1991;14:13–19.
162. Sra J, Jayasiri MR, Avitall B *et al.* Comparison of cardiac pacing with drug therapy in the treatment of neurocardiogenic (vaso vagal) syncope with bradycardia or asystole. *N Engl J Med* 1993;328:1085–1090.
163. Petersen MEV, Chamberlain-Webber R, Fitzpatrick A *et al.* Permanent pacing for cardio-inhibitory malignant vasovagal syndrome. *Br Heart J* 1994;71:274–281.
164. Benditt DG, Petersen MEV, Lurie KG *et al.* Cardiac pacing for prevention of recurrent vasovagal syncope. *Ann Int Med* 1995;122:204–209.
165. Sutton R, Brignole M, Menozzi C *et al.* Dual-chamber pacing in treatment of neurally-mediated tilt-positive cardioinhibitory syncope. Pacemaker versus no therapy: a multicentre randomized study. *Circulation* 2000;102:294–299.
166. Connolly SJ, Sheldon R, Roberts RS *et al.*, Vasovagal Pacemaker Study Investigators. The North American vasovagal pacemaker study (VPS): a randomized trial of permanent cardiac pacing for the prevention of vasovagal syncope. *J Am Coll Cardiol* 1999;33:16–20.
167. Ammirati F, Colivicchi F, Santini M *et al.* Permanent cardiac pacing versus medical treatment for the prevention of recurrent vasovagal syncope. A multicenter, randomized, controlled trial. *Circulation* 2001;104:52–57.
168. Connolly SJ, Sheldon R, Thorpe KE *et al.*, for the VPS II Investigators. Pacemaker therapy for prevention of syncope in patients with recurrent severe vasovagal syncope: Second Vasovagal Pacemaker Study (VPS II). *JAMA* 2003;289:2224–2229.
169. Raviele A, Giada F, Menozzi C *et al.*, Vasovagal Syncope, Pacing Trial Investigators. A randomized, double-blind, placebo-controlled study of permanent cardiac pacing for the treatment of recurrent tilt-induced vasovagal syncope. The Vasovagal Syncope and Pacing Trial (SYNPACE). *Eur Heart J* 2004;25:1741–1748.
170. Brignole M, Sutton R, Menozzi C *et al.* Early application of an implantable loop recorder allows effective specific therapy in patients with recurrent suspected neurally mediated syncope. *Eur Heart J* 2006;27:1085–1092.
171. Ammirati F, Colivicchi F, Santini M. Diagnosing syncope in the clinical practice. Implementation of a simplified diagnostic algorithm in a multicentre prospective trial—the OESIL 2 study (Osservatorio Epidemiologico della Sincope nel Lazio). *Eur Heart J* 2000;21:935–940.
172. Flammang D, Church T, Waynberger M *et al.* Can adenosine 5'triphosphate be used to select treatment in severe vasovagal syncope? *Circulation* 1997;96:1201–1208.
173. Brignole M, Gaggioli G, Menozzi C *et al.* Adenosine-induced atrioventricular block in patients with unexplained syncope. The diagnostic value of ATP test. *Circulation* 1997;96:3921–3927.
174. Donato P, Brignole M, Menozzi C *et al.* Mechanism of syncope in patients with positive ATP test. *J Am Coll Cardiol* 2003;41:93–98.
175. Flammang D, Antiel M, Church T *et al.* Is a pacemaker indicated for vasovagal patients with severe cardioinhibitory reflex as identified by the ATP test? A preliminary randomized trial. *Europace* 1999;1:140–145.
176. Deharo JC, Jego C, Lantaeume A, Dijane P. An implantable loop recorder study of highly symptomatic vasovagal patients: the heart rhythm observed during a spontaneous syncope is identical to the recurrent syncope but not correlated with the head-up tilt test or ATP test. *J Am Coll Cardiol* 2006;47:587–593.
177. Brignole M, Sutton R, Menozzi C *et al.* Lack of correlation between the responses to tilt testing and adenosine triphosphate test and the mechanism of spontaneous neurally-mediated syncope. *Eur Heart J* 2006;27:2232–2239.
178. Thaulow E, Webb G, Hoffman A *et al.* Task Force on the management of grown up congenital heart disease of the European Society of Cardiology. *Eur Heart J* 2003;24:1035–1084.
179. Walsh EP, Cecchin F. Recent advances in pacemaker and implantable defibrillator therapy for young patients. *Curr Opin Cardiol* 2004;19:91–96.
180. Berul C, Cecchin F. Indications and techniques of pediatric cardiac pacing. *Expert Rev Cardiovasc Ther* 2003;1:165–176.
181. Flinn CJ, Wolff GS, Dick M *et al.* Cardiac rhythm after the Mustard operation for complete transposition of the great arteries. *N Engl J Med* 1984;310:1635–1638.
182. Yabek SM, Jarmakani JM. Sinus node dysfunction in children, adolescents, and young adults. *Pediatrics* 1978;61:593–598.
183. Kavey RE, Gaum WE, Byrum CJ, Smith FC, Kveselis DA. Loss of sinus rhythm after total cavopulmonary connection. *Circulation* 1995;92(Suppl. 9):II304–II308.
184. Rein AJ, Simcha A, Ludomirsky A *et al.* Symptomatic sinus bradycardia in infants with structurally normal hearts. *J Pediatr* 1985;107:724–727.
185. Kay R, Estioko M, Wiener I. Primary sick sinus syndrome as an indication for chronic pacemaker therapy in young adults: incidence, clinical features, and long-term evaluation. *Am Heart J* 1982;103:338–342.
186. Mackintosh AF. Sinoatrial disease in young people. *Br Heart J* 1981;45:62–66.

187. Stephenson EA, Casavant D, Tuzi J *et al.* Efficacy of atrial antitachycardia pacing using the Medtronic AT500 pacemaker in patients with congenital heart disease. *Am J Cardiol* 2003;**92**:871–876.
188. Michaelsson M, Engle MA. Congenital complete heart block: an international study of the natural history. *Cardiovasc Clin* 1972;**4**:85–101.
189. Anderson RH, Wenick ACG *et al.* Congenitally complete heart block: developmental aspects. *Circulation* 1977;**56**:90–101.
190. Jaeggi ET, Hamilton RM, Silverman ED, Zamora SA, Homberger LK *et al.* Outcome of children with fetal, neonatal or childhood diagnosis of isolated congenital atrioventricular block. *J Am Coll Cardiol* 2002;**39**:130–137.
191. Odemuyiwa O, Camm AJ. Prophylactic pacing for prevention of sudden death in congenital heart block. *Pacing Clin Electrophysiol* 1992;**15**:1526–1530.
192. Michaelsson M, Jonzon A, Riesenfeld T. Isolated congenital complete atrioventricular block in adult life. A prospective study. *Circulation* 1995;**92**:442–449.
193. Michaelsson M, Riesenfeld T, Jonzon A. Natural history of congenital complete atrioventricular block. *Pacing Clin Electrophysiol* 1997;**20**:2098–2101.
194. Breur JM, Udink ten Cate FE, Kapusta L *et al.* Pacemaker therapy in isolated congenital complete atrioventricular block. *Pacing Clin Electrophysiol* 2002;**25**:1685–1691.
195. Balmer C, Fasnacht M, Rahn M *et al.* Long-term follow up of children with congenital complete atrioventricular block and the impact of pacemaker therapy. *Europace* 2002;**4**:345–349.
196. Dewey RC, Capeless MA, Levy AM. Use of ambulatory electrocardiographic monitoring to identify high-risk patients with congenital complete heart block. *N Engl J Med* 1987;**316**:835–839.
197. Pinsky WW, Gillette PC, Garson A JR *et al.* Diagnosis, management, and long-term results of patients with congenital complete atrioventricular block. *Pediatrics* 1982;**69**:728–733.
198. Villain E, Coatsedoat-Chalumeau N, Marijon E *et al.* Presentation and prognosis of complete atrioventricular block in childhood, according to maternal antibody status. *J Am Coll Cardiol* 2006;**48**:1682–1687.
199. Bruckheimer E, Berul C, Kopf GS *et al.* Late recovery of surgically-induced atrioventricular block in patients with congenital heart disease. *J Interv Card Electrophysiol* 2002;**6**:191–197.
200. Gross GJ, Chiu CC, Hamilton RM *et al.* Natural history of postoperative heart block in congenital heart disease: implications for pacing intervention. *Heart Rhythm* 2006;**3**:601–604.
201. Priori SG, Aliot E, Blomstrom-Lundqvist C *et al.* Task force on sudden cardiac death of the European Society of Cardiology. *Eur Heart J* 2001;**22**:1374–1450.
202. Dorostkar PC, Eldar M, Belhassen B *et al.* Long-term follow-up of patients with long-QT syndrome treated with beta-blocker and continuous pacing. *Circulation* 1999;**100**:2431–2436.
203. Zipes DP, Camm AJ, Borggrefe M *et al.* ACC/AHA/ESC 2006 Guidelines for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death. *J Am Coll Cardiol* 2006;**48**:1064–1108.
204. Walker F, Siu SC, Woods S *et al.* Long-term outcomes of cardiac pacing in adults with congenital heart disease. *J Am Coll Cardiol* 2004;**43**:1894–1901.
205. Sachweh JS, Vazquez-Jimenez JF, Schondube FA *et al.* Twenty years experience with pediatric pacing: epicardial and transvenous stimulation. *Eur J Cardiothorac Surg* 2000;**17**:455–461.
206. Udink ten Cate F, Breur J, Boramanand N *et al.* Endocardial and epicardial steroid lead pacing in the neonatal and paediatric age group. *Heart* 2002;**88**:392–396.
207. Fortescue EB, Berul CI, Cecchin F *et al.* Patient, procedural, and hardware factors associated with pacemaker lead failure in pediatrics and congenital heart disease. *Heart Rhythm* 2004;**1**:150–159.
208. Silvestri MS, Drago F, Grutter G *et al.* Twenty years of paediatric cardiac pacing: 515 pacemakers and 480 leads implanted in 292 patients. *Europace* 2006;**8**:530–536.
209. Thambo JB, Bordachar P, Garrigue S *et al.* Detrimental ventricular remodeling in patients with congenital complete heart block and chronic right ventricular apical pacing. *Circulation* 2004;**110**:3766–3772.
210. Cohen MI, Buck K, Tanel R *et al.* Capture management efficacy in children and young adults with endocardial and unipolar epicardial systems. *Europace* 2004;**6**:248–255.
211. Janousek J, Tomek V, Chaloupecky VA *et al.* Cardiac resynchronization therapy: a novel adjunct to treatment and prevention of systemic right ventricular failure. *J Am Coll Cardiol* 2004;**44**:1927–1931.
212. Dubin AM, Janousek J, Rhee E *et al.* Resynchronization therapy in pediatric and congenital heart disease patients: an international multicenter study. *J Am Coll Cardiol* 2005;**46**:2277–2283.
213. Moak JP, Hasbani K, Ramwell C *et al.* Dilated cardiomyopathy following right ventricular pacing for AV block in young patients: resolution after upgrading to biventricular pacing systems. *J Cardiovasc Electrophysiol* 2006;**17**:1068–1071.
214. Miyamoto Y, Curtiss E, Kormos R *et al.* Bradycardia after heart transplantation. *Circulation* 1990;**82**(Suppl. IV):313–317.
215. DiBiase A, Tse TM, Schnittger I *et al.* Frequency and mechanism of bradycardia in cardiac transplant recipients and need for pacemakers. *Am J Cardiol* 1991;**67**:1385–1389.
216. Jacquet L, Ziady G, Stein K *et al.* Cardiac rhythm disturbances early after orthotopic heart transplantation: prevalence and clinical importance of the observed arrhythmias. *J Am Coll Cardiol* 1990;**16**:832–837.
217. Holt ND, McComb JM. Cardiac transplantation and pacemakers: when and what to implant? *CEPR* 2002;**6**:140–151.
218. Parry G, Holt ND, Dark JH *et al.* Declining need for pacemaker implantation after cardiac transplantation. *Pacing Clin Electrophysiol* 1998;**21**:2350–2352.
219. Melton IC, Gilligan DM, Wood MA *et al.* Optimal cardiac pacing after heart transplantation. *Pacing Clin Electrophysiol* 1999;**22**:1510–1527.
220. Scott CD, Dark JH, McComb JM. Evolution of the chronotropic response to exercise after cardiac transplantation. *Am J Cardiol* 1995;**76**:1292–1296.
221. Spirito P, Seidman CE, McKenna WJ *et al.* The management of hypertrophic cardiomyopathy. *N Engl J Med* 1997;**336**:775–785.
222. Hassenstein P, Wolter HH. Therapeutische Beherrschung einer bedrohlichen Situation bei der ideopathischen hypertrophischen Subaortenstenose. *Verh Dtsh Ges Kreisl* 1967;**33**:242–246.
223. Rothlin M, Mocetti T. Beeinflussung der muskulären Subaortenstenose durch intraventrikuläre Reizausbreitung. *Verh Dtsh Ges Kreisl* 1967;**27**:411–415.
224. Gilgenkrantz JM, Cherrier F, Petitier H *et al.* Cardiomyopathie obstructive du ventricule gauche avec bloc auriculo-ventriculaire complet. *Arch Mal Coeur* 1968;**60**:439–453.
225. Jeanrenaud X, Goy JJ, Kappenberger L. Effects of dual chamber pacing in hypertrophic obstructive cardiomyopathy. *Lancet* 1992;**339**:1318–1323.
226. Prinzen FW, van Oosterhout MFM, Delhaas T *et al.* Epicardial ventricular pacing at physiological heart rate leads to asymmetrical changes in left ventricular wall thickness. *Eur Heart J* 1994;**15**(Suppl.):76.
227. Pak PH, Maughan L, Baughman KL *et al.* Mechanism of acute mechanical benefit from VDD pacing in hypertrophied heart similarity of responses in hypertrophic cardiomyopathy and hypertensive heart disease. *Circulation* 1998;**98**:242–248.
228. Prinzen FW, Augustijn CH, Arts T *et al.* The time sequence of electrical and mechanical activation during spontaneous beating and ectopic stimulation. *Eur Heart J* 1992;**13**:535–543.
229. Prinzen FW, Augustijn CH, Arts T *et al.* Redistribution of myocardial fiber strain and blood flow by asynchronous activation. *Am J Physiol* 1990;**258**:H300–H308.
230. Pasma J, Blanksma P, Van der Wall E *et al.* Effects of permanent dual chamber pacing on myocardial perfusion in symptomatic hypertrophic cardiomyopathy. *Heart* 1996;**76**:358–362.
231. Pavin D, De Place H, Le Breton H *et al.* Effects of permanent dual chamber pacing on mitral regurgitation in hypertrophic obstructive cardiomyopathy. *Eur Heart J* 1999;**20**:203–210.
232. Nishimura RA, Hayes DL, Ilstrup DM *et al.* Effect of dual chamber pacing on systolic and diastolic function in patients with hypertrophic obstructive cardiomyopathy. Acute Doppler echocardiographic and catheterization hemodynamic study. *J Am Coll Cardiol* 1996;**27**:421–430.
233. Betocchi S, Bonow BO, Bacharach SL *et al.* Isovolumic relaxation period in hypertrophic cardiomyopathy. *J Am Coll Cardiol* 1986;**7**:74–81.
234. Betocchi S, Losi MA, Piscione T *et al.* Effects of dual-chamber pacing in hypertrophic cardiomyopathy on left ventricular outflow tract obstruction and on diastolic function. *Am J Cardiol* 1996;**77**:498–502.
235. Watanabe K, Sekiya M, Ikeda S *et al.* Subacute and chronic effects of DDD pacing on left ventricular diastolic function in patients with non-obstructive hypertrophic cardiomyopathy. *Jpn Circ J* 2001;**65**:283–288.
236. Betocchi S, Elliott PM, Bruguera C *et al.* Dual chamber pacing in hypertrophic cardiomyopathy: long term effects on diastolic function. *Pacing Clin Electrophysiol* 2002;**25**:1433–1440.
237. Gadler F, Linde C, Ryden L. Rapid return of left ventricular outflow tract obstruction and symptoms following cessation of long-term

- atrioventricular synchronous pacing for obstructive hypertrophic cardiomyopathy. *Am J Cardiol* 1999;**83**:553–557.
238. Patel P, Hussain W, Linde C *et al.* Pacing increases Connexin 43 expression in patients with hypertrophic cardiomyopathy. *Heart Rhythm* 2004;**1**:S22.
 239. McDonald K, McWilliamas E, O'Keefe B *et al.* Functional assessment of patients treated with permanent dual chamber pacing as a primary treatment for hypertrophic cardiomyopathy. *Eur Heart J* 1988;**9**: 893–898.
 240. Fananapazir L, Cannon RO, Tripodi D *et al.* Impact of dual chamber permanent pacing in patients with obstructive hypertrophic cardiomyopathy with symptoms refractory to verapamil and adrenergic blocker therapy. *Circulation* 1992;**85**:2149–2161.
 241. Fananapazir L, Epstein ND, Curiel RV *et al.* Long-term results of dual-chamber (DDD) pacing in obstructive hypertrophic cardiomyopathy: evidence for progressive symptomatic and hemodynamic improvement and reduction of left ventricular hypertrophy. *Circulation* 1994;**90**: 2731–2741.
 242. Kappenberger L, Linde C, Daubert JC *et al.* and the Pacing in Cardiomyopathy (PIC) Study Group. Pacing in hypertrophic obstructive cardiomyopathy—a randomised crossover study. *Eur Heart J* 1997;**18**: 1249–1256.
 243. Kappenberger LJ, Linde C, Jeanrenaud X *et al.* and the Pacing in Cardiomyopathy (PIC) Study Group. Clinical progress after randomised on/off pacemaker treatment for hypertrophic obstructive cardiomyopathy. *Europace* 1999;**1**:77–84.
 244. Maron BJ, Nishimura RA, McKenna WJ *et al.*, for the M-PATHY Study Investigators. Assessment of permanent dual-chamber pacing as a treatment for drug-refractory symptomatic patients with obstructive hypertrophic cardiomyopathy. *Circulation* 1999;**99**:2927–2933.
 245. Nishimura RA, Trusty JM, Hayes DL *et al.* Dual chamber pacing for hypertrophic obstructive cardiomyopathy; a randomised double-blind crossover study. *J Am Coll Cardiol* 1997;**29**:435–441.
 246. Linde C, Gadler F, Kappenberger L *et al.* Does pacemaker implantation carry a placebo effect? *Am J Cardiol* 1999;**83**:903–907.
 247. Gadler F, Linde C, Kappenberger L *et al.* Significant improvement in quality of life following atrioventricular synchronous pacing in patients with hypertrophic obstructive cardiomyopathy. *Eur Heart J* 1999;**20**: 1044–1050.
 248. Gadler F, Linde C, Juhlin-Dannfelt A, Ribeiro A, Ryden L. Long term effects of dual chamber pacing in patients with hypertrophic obstructive cardiomyopathy without outflow obstruction at rest. *Eur Heart J* 1997;**18**:636–642.
 249. Gadler F, Linde C, Juhlin-Dannfelt A *et al.* Influence of right ventricular pacing site on left ventricular outflow tract obstruction in patients with hypertrophic obstructive cardiomyopathy. *J Am Coll Cardiol* 1996;**27**: 1219–1224.
 250. Gras D, De Place H, Le Breton H *et al.* L'importance du synchronisme auriculo-ventriculaire dans la cardiomyopathie hypertrophique obstructive traitée par stimulation cardiaque. *Arch Mal Coeur* 1995;**88**: 215–223.
 251. Jeanrenaud X, Schlapper J, Froome M *et al.* Dual chamber pacing in hypertrophic obstructive cardiomyopathy: beneficial effect of AV nodal ablation of optimal left ventricular capture and filling. *Pacing Clin Electrophysiol* 1997;**20**:293–300.
 252. Ommen SR, Nishimura RA, Squires RW, Schaff HV, Danielson G, Tajik AJ. Comparison of dual-chamber pacing versus septal myectomy for the treatment of patients with hypertrophic obstructive cardiomyopathy: a comparison of objective hemodynamic and exercise end points. *J Am Coll Cardiol* 1999;**34**:191–196.
 253. Young T, Palta M, Dempsey J *et al.* The occurrence of sleep-disordered breathing among middle-aged adults. *N Engl J Med* 1993;**328**: 1230–1235.
 254. Shahar E, Whitney CW, Redline S *et al.* Sleep-disordered breathing and cardiovascular disease: cross-sectional results of the Sleep Heart Health Study. *Am J Respir Crit Care Med* 2001;**163**:19–25.
 255. Peker Y, Hedner J, Kraiczi H *et al.* Respiratory disturbance index: an independent predictor of mortality in coronary artery disease. *Am J Respir Crit Care Med* 2000;**162**:81–86.
 256. Nadar S, Prasad N, Taylor RS, Lip GY. Positive pressure ventilation in the management of acute and chronic cardiac failure: a systematic review and meta-analysis. *Int J Cardiol* 2005;**99**:171–185.
 257. Garrigue S, Bordier P, Jais P *et al.* Benefit of atrial pacing in sleep apnea syndrome. *N Engl J Med* 2002;**346**:404–412.
 258. Simantirakis EN, Schiza SE, Chrysostomakis SI *et al.* Atrial overdrive pacing for the obstructive sleep apnea-hypopnea syndrome. *N Engl J Med* 2005;**353**:2568–2577.
 259. Pepin J-L, Defaye P, Garrigue S *et al.* Overdrive atrial pacing does not improve obstructive sleep apnoea syndrome. *Eur Respir J* 2005;**25**: 343–347.
 260. Luthje L, Unterberg-Buchwald C, Dajani D *et al.* Atrial overdrive pacing in patients with sleep apnea with implanted pacemaker. *Am J Respir Crit Care Med* 2005;**172**:118–122.
 261. Unterberg C, Luthje L, Szych J, Vollmann D, Hasenfuss G, Andreas S. Atrial overdrive pacing compared to CPAP in patients with obstructive sleep apnoea syndrome. *Eur Heart J* 2005;**26**:2658–2675.
 262. Krahn AD, Yee R, Erickson MK *et al.* Physiologic pacing in patients with obstructive sleep apnea: a prospective, randomized crossover trial. *J Am Coll Cardiol* 2006;**47**:379–383.
 263. Sinha AM, Skobel EC, Breithardt OA *et al.* Cardiac resynchronization therapy improves central sleep apnea and Cheyne–Stokes respiration in patients with chronic heart failure. *J Am Coll Cardiol* 2004;**44**:68–71.
 264. Skobel EC, Sinha AM, Norra C *et al.* Effect of cardiac resynchronization therapy on sleep quality, quality of life, and symptomatic depression in patients with chronic heart failure and Cheyne–Stokes respiration. *Sleep Breath* 2005;**9**:159–166.
 265. Vagnini FJ, Gourin A, Antell H *et al.* Implantation sites of cardiac pacemaker electrodes and myocardial contractility. *Ann Thorac Surg* 1967;**4**: 431–439.
 266. Tyers GF. Comparison of the effect on cardiac function of single-site and simultaneous multiple-site ventricular stimulation after A-V block. *J Thorac Cardiovasc Surg* 1970;**59**:211–217.
 267. Gibson DG, Chamberlain DA, Coltart DJ *et al.* Effect of changes in ventricular activation on cardiac haemodynamics in man. Comparison of right ventricular, left ventricular, and simultaneous pacing of both ventricles. *Br Heart J* 1971;**33**:397–400.
 268. De Teresa E, Chamorro JL, Pupon A. An even more physiological pacing: changing the sequence of ventricular activation. In: Steinbach E, ed. *Proceedings of the VIIth World Congress on Cardiac Pacing*, Vienna, Austria; 1983. p95–100.
 269. Cazeau S, Ritter P, Bakdach S *et al.* Four chamber pacing in dilated cardiomyopathy. *Pacing Clin Electrophysiol* 1994;**17**:1974–1979.
 270. Bakker P, Meijburg H, De Vries JW *et al.* Biventricular pacing in end-stage heart failure improves functional capacity and left ventricular function. *J Interv Cardiol* 2000;**4**:395–404.
 271. Hawkins NM, Petrie MC, MacDonald MR, Hogg KJ, McMurray JJV. Selecting patients for cardiac resynchronisation therapy: electrical or mechanical dyssynchrony? *Eur Heart J* 2006;**27**:1270–1281.
 272. Vernooy K, Verbeek XAAM, Peschar M *et al.* Left bundle branch block induces ventricular remodelling and functional septal hypoperfusion. *Eur Heart J* 2005;**26**:91–98.
 273. Spragg DD, Leclercq C, Loughmani M *et al.* Regional alterations in protein expression in the dyssynchronous failing heart. *Circulation* 2003;**108**: 929–932.
 274. Nowak B, Sinha A, Schaefer W *et al.* Cardiac resynchronization therapy homogenizes myocardial glucose metabolism and perfusion in dilated cardiomyopathy and left bundle branch block. *J Am Coll Cardiol* 2003;**41**:1523–1528.
 275. Ukkonen H, Beanlands R, Burwash I *et al.* Effect of cardiac resynchronization on myocardial efficiency and regional oxidative metabolism. *Circulation* 2003;**107**:28–31.
 276. Sundell J, Engblom E, Koistinen J *et al.* The effects of cardiac resynchronization therapy on left ventricular function, myocardial energetics and metabolic reserve in patients with dilated cardiomyopathy and heart failure. *J Am Coll Cardiol* 2004;**43**:1027–1033.
 277. Alonso C, Leclercq C, Victor F *et al.* Electrocardiographic predictive factors of long-term clinical improvement with multisite biventricular pacing in advanced heart failure. *Am J Cardiol* 1999;**84**:1417–1421.
 278. Leclercq C, Cazeau S, Ritter P *et al.* A pilot experience with permanent biventricular pacing to treat advanced heart failure. *Am Heart J* 2000;**140**:862–870.
 279. Ricci R, Ansalone G, Toscano S *et al.* Cardiac resynchronization: materials, technique, and results. The InSync Italian Registry. *Eur Heart J* 2000;**2**:J6–J15.
 280. Gras D, Leclercq C, Tang AS *et al.* Cardiac resynchronization therapy in advanced heart failure: the multicenter InSync clinical study. *Eur J Heart Fail* 2002;**4**:311–320.
 281. Cazeau S, Leclercq C, Lavergne T *et al.* Effects of multisite biventricular pacing in patients with heart failure and intraventricular conduction delay. *N Engl J Med* 2001;**344**:873–880.

282. Abraham WT, Fisher WG, Smith AL *et al.* Cardiac resynchronization in chronic heart failure. *N Engl J Med* 2002;**346**:1845–1853.
283. Auricchio A, Stellbrink C, Sack S *et al.*, Pacing Therapies in Congestive Heart Failure (PATH-CHF) Study Group. Long-term clinical effect of haemodynamically optimized cardiac resynchronization therapy in patients with heart failure and ventricular conduction delay. *J Am Coll Cardiol* 2002;**39**:2026–2033.
284. Auricchio A, Stellbrink C, Butter C *et al.* Clinical efficacy of cardiac resynchronization therapy using left ventricular pacing in heart failure patients stratified by severity of ventricular conduction delay. *J Am Coll Cardiol* 2003;**42**:2109–2116.
285. Higgins S, Hummel J, Niazi I *et al.* Cardiac resynchronization therapy for the treatment of heart failure in patients with intraventricular conduction delay and malignant ventricular tachyarrhythmias. *J Am Coll Cardiol* 2003;**42**:1454–1459.
286. Young JB, Abraham WT, Smith AL *et al.* Combined cardiac resynchronization and implantable cardioverter defibrillation in advanced chronic heart failure: the MIRACLE ICD trial. *JAMA* 2003;**289**:2685–2694.
287. Abraham WT, Young JB, Leon AR *et al.*, Multicenter InSync ICD II Study Group. Effects of cardiac resynchronization on disease progression in patients with left ventricular dysfunction, an indication for an implantable cardioverter-defibrillator, and mildly symptomatic heart failure. *Circulation* 2004;**110**:2864–2868.
288. Bristow MR, Saxon LA, Boehmer J *et al.*, Comparison of Medical Therapy, Pacing, Defibrillation in Heart Failure (COMPANION) Investigators. Cardiac-resynchronization therapy with or without an implantable defibrillator in advanced chronic heart failure. *N Engl J Med* 2004;**350**:2140–2150.
289. Cleland JGF, Daubert JC, Erdmann E *et al.* The effect of cardiac resynchronization therapy on morbidity and mortality in heart failure (the CARDiac RESynchronization-Heart Failure [CARE-HF] Trial). *N Engl J Med* 2005;**352**:1539–1549.
290. Bradley D, Bradley E, Baughmann *et al.* Cardiac resynchronization and death from progressive heart failure. *JAMA* 2003;**289**:730–740.
291. Mc Alister EA, Ezekowitz JA, Wiebe N *et al.* Systematic review: cardiac resynchronization in patients with symptomatic heart failure. *Ann Intern Med* 2004;**141**:381–390.
292. Freemantle N, Tharmanathan P, Calvert MJ, Abraham WT, Ghosh J, Cleland JGF. Cardiac resynchronization for patients with heart failure and left ventricular systolic dysfunction: a systematic review and meta-analysis. *Eur J Heart Fail* 2006;**8**:433–440.
293. Linde C, Leclercq C, Rex S *et al.* Long-term benefits of biventricular pacing in congestive heart failure: results from the MUSTIC study. *J Am Coll Cardiol* 2002;**40**:111–118.
294. Cleland JGF, Daubert JC, Erdmann E *et al.* Longer-term effects of cardiac resynchronization therapy on mortality in heart failure [The Cardiac Resynchronization-Heart Failure (CARE-HF) trial extension phase]. *Eur Heart J* 2006;**27**:1928–1932.
295. Duncan A, Wait D, Gibson D *et al.* Left ventricular remodeling and hemodynamic effects of multisite pacing in patients with left systolic dysfunction and activation disturbances in sinus rhythm: sub-study of the MUSTIC trial. *Eur Heart J* 2003;**24**:430–441.
296. Stellbrink C, Breithardt O, Franke A. Impact of cardiac resynchronization therapy using hemodynamically optimized pacing on left ventricular remodeling in patients with congestive heart failure and ventricular conduction disturbances. *J Am Coll Cardiol* 2001;**38**:1957–1965.
297. St John Sutton M, Plappert T, Abraham W *et al.* Effect of cardiac resynchronization therapy on left ventricular size and function in chronic heart failure. *Circulation* 2003;**107**:1985–1990.
298. Feldman AM, de Lissovoy G, De Marco T *et al.* Cost effectiveness of cardiac resynchronization therapy in the comparison of medical therapy, pacing and defibrillation in Heart failure (COMPANION) trial. *J Am Coll Cardiol* 2005;**46**:2311–2321.
299. Calvert M, Freemantle N, Yao G *et al.* Cost-effectiveness of cardiac resynchronization therapy: results from the CARE-HF trial. *Eur Heart J* 2005;**26**:2681–2688.
300. Yao GL, Freemantle N, Calvert MJ, Bryan S, Daubert JC, Cleland JG. The long-term cost-effectiveness of cardiac resynchronization therapy with or without an implantable cardioverter-defibrillator. *Eur Heart J* 2007;**28**:42–51.
301. Leclercq C, Hare J. Ventricular resynchronization. Current state of the art. *Circulation* 2004;**10**:296–299.
302. Bleeker G, Schalij, Molhoek S *et al.* Frequency of left ventricular dyssynchrony in patients with heart failure and a narrow QRS complex. *Am J Cardiol* 2005;**95**:140–142.
303. Ghio S, Constantin C, Klersy C *et al.* Interventricular and intraventricular dyssynchrony are common in heart failure patients, regardless of QRS duration. *Eur Heart J* 2004;**25**:571–578.
304. Bader H, Garrigue S, Lafitte S *et al.* Intra-left ventricular electromechanical asynchrony. A new independent predictor of severe cardiac events in heart failure patients. *J Am Coll Cardiol* 2004;**43**:248–256.
305. Yu C-M, Chan Y-S, Zhang Q *et al.* Benefits of cardiac resynchronization therapy for heart failure patients with narrow QRS complexes and coexisting systolic asynchrony by echocardiography. *J Am Coll Cardiol* 2006;**48**:2251–2257.
306. Achilli A, Sassara M, Ficili S *et al.* Long-term effectiveness of cardiac resynchronization therapy in patients with refractory heart failure and narrow QRS. *J Am Coll Cardiol* 2003;**42**:2117–2124.
307. Gasparini M, Mantica M, Galimberti P *et al.* Beneficial effects of biventricular pacing in patients with a narrow QRS. *Pacing Clin Electrophysiol* 2003;**26**:169–174.
308. Bleeker GB, Holman ER, Steendijk P *et al.* Cardiac resynchronization therapy in patients with a narrow QRS complex. *J Am Coll Cardiol* 2006;**48**:2243–2250.
309. Daubert JC. Atrial fibrillation and heart failure: a mutually noxious association. *Europace* 2004;**5**:S1–S4.
310. Baldasseroni S, Opasich C, Gorini M *et al.* Left bundle branch block is associated with increased 1-year sudden and total mortality rate in 5517 outpatients with congestive heart failure: a report from the Italian network on congestive heart failure. *Am Heart J* 2002;**143**:398–405.
311. Leclercq C, Walker S, Linde C *et al.* Comparative effects of permanent biventricular and right-univentricular pacing in heart failure patients with chronic atrial fibrillation. *Eur Heart J* 2002;**23**:1780–1787.
312. Gasparini M, Auricchio A, Regoli F *et al.* Four-year efficacy of cardiac resynchronization therapy on exercise tolerance and disease progression: the importance of performing atrioventricular junction ablation in patients with atrial fibrillation. *J Am Coll Cardiol* 2006;**48**:734–743.
313. Leclercq C, Cazeau S, Lellouche D *et al.* Upgrading from single chamber right ventricular to biventricular pacing in permanently paced patients with worsening heart failure: the RD-CHF study. *Pacing Clin Electrophysiol* 2007;**30**(Suppl. 1):S23–S30.
314. Brignole F, Gammage M, Puggioni E *et al.* Comparative assessment of right, left, and biventricular pacing in patients with permanent atrial fibrillation. *Eur Heart J* 2005;**7**:712–722.
315. Doshi RN, Daoud EG, Fellows C *et al.*, PAVE Study Group. Left ventricular-based cardiac stimulation post AV nodal ablation evaluation (the PAVE study). *J Cardiovasc Electrophysiol* 2005;**16**:1160–1165.
316. Packer M. Proposal for a new clinical end point to evaluate the efficacy of drugs and devices in the treatment of chronic heart failure. *J Card Fail* 2001;**7**:176–182.
317. Cohn JN, Ferrari R, Sharpe N. Cardiac remodelling: concept and clinical implications. A consensus paper from an international forum on cardiac remodelling. *J Am Coll Cardiol* 2000;**35**:569–582.
318. Janousek J, Vojtovic P, Hucin B *et al.* Resynchronization pacing is a useful adjunct to the management of acute heart failure after surgery for congenital heart defects. *Am J Cardiol* 2001;**88**:145–152.
319. Zimmerman FJ, Starr JP, Koenig PR, Smith P, Hijazi ZM, Bacha EA. Acute hemodynamic benefit of multisite ventricular pacing after congenital heart surgery. *Ann Thorac Surg* 2003;**75**:1775–1780.
320. Pham PP, Balaji S, Shen I, Ungerleider R, Li X, Sahn DJ. Impact of conventional versus biventricular pacing on hemodynamics and tissue Doppler imaging indexes of resynchronization postoperatively in children with congenital heart disease. *J Am Coll Cardiol* 2005;**46**:2284–2289.
321. Dubin AM, Feinstein JA, Reddy VM, Hanley FL, Van Hare GF, Rosenthal DN. Electrical resynchronization: a novel therapy for the failing right ventricle. *Circulation* 2003;**107**:2287–2289.
322. Zipes DP, Camm AJ, Borggrefe M *et al.* ACC/AHA/ESC 2006 Guidelines for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death. *Circulation* 2006;**114**:e385–e484.
323. Moss AJ, Hall WJ, Cannom DS *et al.* Improved survival with an implanted defibrillator in patients with coronary disease at high risk for ventricular arrhythmia. *N Engl J Med* 1996;**335**:1933–1940.
324. Buxton AE, Lee KL, Fisher JD *et al.*, for the Multicenter Unsustained Tachycardia Trial Investigators. A randomized study of the prevention of sudden death in patients with coronary artery disease. *N Engl J Med* 1999;**341**:1882–1890.

325. Moss AJ, Zareba W, Hall JW *et al.* Prophylactic implantation of a defibrillator in patients with myocardial infarction and reduced ejection fraction. *N Engl J Med* 2002;**346**:877–883.
326. Bardy GH, Lee KL, Mark DB *et al.* Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT) Investigators: amiodarone or an implantable cardioverter-defibrillator for congestive heart failure. *N Engl J Med* 2005;**352**:225–237.
327. Kadish A, Dyer A, Daubert JP *et al.* Prophylactic defibrillator implantation in patients with nonischemic dilated cardiomyopathy. *N Engl J Med* 2004;**350**:2151–2158.
328. Strickberger SA, Hummel JD, Bartlett TG *et al.* Amiodarone versus implantable cardioverter-defibrillator: randomized trial in patients with non-ischemic dilated cardiomyopathy and asymptomatic non-sustained ventricular tachycardia—AMIOVIRT. *J Am Coll Cardiol* 2003;**41**:1707–1712.
329. Bansch D, Antz M, Boczor S *et al.* Primary prevention of sudden cardiac death in idiopathic dilated cardiomyopathy: the Cardiomyopathy Trial (CAT). *Circulation* 2002;**105**:1453–1458.
330. Rivero-Ayerza M, Theuns D, Garcia-garcia HM, Boersma E, Simoons M, Jordaens LJ. Effects of cardiac resynchronization therapy on overall mortality and mode of death: a meta-analysis of randomized controlled trials. *Eur Heart J* 2006;**27**:2682–2688.
331. Auricchio A, Metra M, Gasparini M *et al.*, for the Multicenter Longitudinal Observational Study (MILOS) Group. Long-term survival of patients with heart failure and ventricular conduction delay treated with cardiac resynchronization therapy. *Am J Cardiol* 2007;**99**:232–238.
332. Gasparini M, Bocchiardo M, Lunati M *et al.* Comparison of 1 year effects of left ventricular and biventricular pacing in heart failure patients with ventricular arrhythmias and left bundle-branch block: the BELIEVE (Bi vs left ventricular pacing: an international pilot evaluation on heart failure patients with ventricular arrhythmias) multi-center prospective randomized pilot study. *Am Heart J* 2006;**152**:e1–e7.
333. Touiza A, Etienne Y, Gilard M *et al.* Long-term left ventricular pacing: assessment and comparison with biventricular pacing in patients with severe congestive heart failure. *J Am Coll Cardiol* 2001;**38**:1966–1970.
334. Blanc JJ, Bertault-Valls V, Fatemi M *et al.* Midterm benefits of left uni-ventricular pacing in patients with congestive heart failure. *Circulation* 2004;**109**:1741–1744.
335. Blanc JJ, Etienne Y, Gilard M *et al.* Evaluation of different ventricular pacing sites in patients with severe heart failure. Results of an acute hemodynamic study. *Circulation* 1997;**96**:3273–3277.
336. Blanc JJ, Etienne Y, Gilard M *et al.* Left ventricular stimulation in treatment of heart failure. *Presse Med* 2000;**29**:1788–1792.
337. Wilkoff BL, Cook JR, Epstein AE *et al.* Dual-chamber or ventricular backup pacing in patients with an implantable defibrillator: the dual Chamber and VVI Implantable Defibrillator (DAVID) Trial. *JAMA* 2002;**288**:3115–3123.
338. Sweeney MO, Hellkamp AS, Ellenbogen KA *et al.* Adverse effect of ventricular pacing in heart failure and atrial fibrillation among patients with normal baseline QRS duration in a clinical trial of pacemaker therapy for sinus node dysfunction. *Circulation* 2003;**107**:2932–2937.
339. Ritter P, Padeletti L, Gillio-Meina L, Gaggini G. Determination of the optimal atrioventricular delay in DDD pacing. Comparison between echo and peak endocardial acceleration measurements. *Europace* 1999;**1**:126–130.
340. Verbeek XA, Vernooy K, Peschar M *et al.* Intraventricular resynchronization for optimal left ventricular function during pacing in experimental left bundle-branch block. *J Am Coll Cardiol* 2003;**42**:558–567.
341. Parreira L, Santos JF, Madeira J *et al.* Cardiac resynchronization therapy with sequential biventricular pacing: impact of echocardiography guided VV delay optimisation on acute results. *Rev Port Cardiol* 2005;**24**:1355–1365.
342. Bernstein AD, Irwin ME, Parsonnet V. Antibradycardia-pacemaker follow-up: effectiveness, needs, and resources. *Pacing Clin Electrophysiol* 1994;**17**:1714–1729.
343. Sutton R. Guidelines for pacemaker follow up. Report of a British Pacing and Electrophysiology Group (BPEG) policy conference on pacemaker follow up. *Heart* 1996;**76**:458–460.
344. Petch M. Driving and heart disease. *Eur Heart J* 1998;**19**:1165–1177.
345. Pinski SL, Trohman RG. Interferences in implantable cardiac devices, part I. *Pacing Clin Electrophysiol* 2002;**25**:1367–1381.
346. Niehaus M, Tebbenjohanns J. Electromagnetic interference in patients with implanted pacemakers or cardioverter-defibrillators. *Heart* 2001;**86**:246–248.
347. Hayes DL, Wang PJ, Reynolds DW *et al.* Interference with cardiac pacemakers by cellular telephones. *N Engl J Med* 1997;**336**:1473–1479.
348. Pinski SL, Trohman RG. Interferences in implantable cardiac devices, part II. *Pacing Clin Electrophysiol* 2002;**25**:1496–1509.
349. Prasad SK, Pennell DJ. Safety of cardiovascular magnetic resonance in patients with cardiovascular implants and devices. *Heart* 2004;**90**:1241–1244.
350. Hayes DL, Strathmore NF. Electromagnetic interference with implantable devices. In: Elenbogen KA, Kay GN, Wilkoff BL, eds. *Clinical Cardiac Pacing and Defibrillation*. 2nd edn. Philadelphia: W.B. Saunders Company; 2000. p939–952.
351. Atlee JL, Bernstein AD. Cardiac rhythm management devices (part II): perioperative management. *Anesthesiology* 2001;**95**:1492–1506.
352. Pfeiffer D, Tebbenjohanns J, Schumacher B, Jung W, Luderitz B. Pacemaker function during radiofrequency ablation. *Pacing Clin Electrophysiol* 1995;**18**:1037–1044.
353. Langberg J, Abber J, Thuroff JW, Griffin JC. The effects of extracorporeal shock wave lithotripsy on pacemaker function. *Pacing Clin Electrophysiol* 1987;**10**:1142–1146.
354. Achenbach S, Moshage W, Diem B, Biebler T, Schibgilla V, Bachmann K. Effects of magnetic resonance imaging on cardiac pacemaker and electrodos. *Am Heart J* 1997;**134**:467–473.
355. Gregoratos G, Abrams J, Epstein AE *et al.* American College of Cardiology/American Heart Association Task Force on Practice Guidelines American College of Cardiology/American Heart Association/North American Society for Pacing and Electrophysiology Committee: ACC/AHA/NASPE 2002 guideline update for implantation of cardiac pacemakers and antiarrhythmia devices: summary article. A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (ACC/AHA/NASPE Committee to Update the 1998 Pacemaker Guidelines). *J Cardiovasc Electrophysiol* 2002;**13**:1183–1199.
356. Hayes DL, Naccarelli GV, Furman S *et al.* Report of the NASPE Policy Conference training requirements for permanent pacemaker selection, implantation, and follow-up. North American Society of Pacing and Electrophysiology. *Pacing Clin Electrophysiol* 1994;**17**:6–12.
357. Rouleau F, Merheb M, Geffroy S *et al.* Echocardiographic assessment of the interventricular delay of activation and correlation to the QRS width in dilated cardiomyopathy. *Pacing Clin Electrophysiol* 2001;**24**:1500–1506.
358. Pitzalis MV, Iacoviello M, Romito R *et al.* Cardiac resynchronization therapy tailored by echocardiographic evaluation of ventricular asynchrony. *J Am Coll Cardiol* 2002;**40**:1615–1622.
359. Sogaard P, Egeblad H, Kim WY *et al.* Tissue Doppler imaging predicts improved systolic performance and reversed left ventricular remodeling during long-term cardiac resynchronization therapy. *J Am Coll Cardiol* 2002;**40**:723–730.
360. Breithardt OA, Stellbrink C, Kramer AP *et al.*, Study Group. Pacing Therapies for Congestive Heart Failure. Echocardiographic quantification of left ventricular asynchrony predicts an acute hemodynamic benefit of cardiac resynchronization therapy. *J Am Coll Cardiol* 2002;**40**:536–545.
361. Yu CM, Fung WH, Lin H *et al.* Predictors of left ventricular reverse remodeling after cardiac resynchronization therapy for heart failure secondary to idiopathic dilated or ischemic cardiomyopathy. *Am J Cardiol* 2003;**91**:684–688.
362. Breithardt OA, Stellbrink C, Herbots L *et al.* Cardiac resynchronization therapy can reverse abnormal myocardial strain distribution in patients with heart failure and left bundle branch block. *J Am Coll Cardiol* 2003;**42**:486–494.
363. Bax JJ, Bleeker GB, Marwick TH *et al.* Left ventricular dyssynchrony predicts response and prognosis after cardiac resynchronization therapy. *J Am Coll Cardiol* 2004;**44**:1834–1840.
364. Penicka M, Bartunek J, De Bruyne B *et al.* Improvement of left ventricular function after cardiac resynchronization therapy is predicted by tissue Doppler imaging echocardiography. *Circulation* 2004;**109**:978–983.
365. Gorgsan J III, Kanzaki H, Bazaz R *et al.* Usefulness of echocardiographic tissue synchronization imaging to predict acute response to cardiac resynchronization therapy. *Am J Cardiol* 2004;**93**:1178–1181.
366. Yu CM, Fung JW, Zhang Q *et al.* Tissue Doppler imaging is superior to strain rate imaging and postsystolic shortening on the prediction of reverse remodeling in both ischemic and nonischemic heart failure after cardiac resynchronization therapy. *Circulation* 2004;**110**:66–73.
367. Bordachar P, Lafitte S, Reuter S *et al.* Echocardiographic parameters of ventricular dyssynchrony validation in patients with heart failure using sequential biventricular pacing. *J Am Coll Cardiol* 2004;**44**:2157–2165.

368. Yu CM, Bleeker GB, Fung JW *et al.* Left ventricular reverse remodeling but not clinical improvement predicts long-term survival after cardiac resynchronization therapy. *Circulation* 2005;112:1580–1586.
369. Marcus GM, Rose E, Vioria EM *et al.* Septal to posterior wall motion delay fails to predict reverse remodeling or clinical improvement in patients undergoing cardiac resynchronization therapy. *J Am Coll Cardiol* 2005;46:2208–2214.
370. Opasich C, Pinna GD, Bobbio M *et al.* Peak exercise oxygen consumption in chronic heart failure: toward efficient use in the individual patient. *J Am Coll Cardiol* 1998;31:766–775.
371. Ingle L, Shelton RJ, Rigby AS, Nabb S, Clark AL, Cleland JG. The reproducibility and sensitivity of the 6-min walk test in elderly patients with chronic heart failure. *Eur Heart J* 2005;26:1742–1751.
372. Rector TS, Kubo SH, Cohn JN. Patients' self assessment of their congestive heart failure content, reliability and validity of a new measure—The Minnesota Living with Heart Failure questionnaire. *Heart Fail* 1987;3:198–207.
373. Butter C, Auricchio A, Stellbrink C *et al.*, Pacing Therapy for Chronic Heart Failure II Study Group. Effect of resynchronization therapy stimulation site on the systolic function of heart failure patients. *Circulation* 2001;104:3026–3029.
374. Bernstein AD, Irwin ME, Parsonnet V *et al.* Report of the NASPE policy conference on antibradycardia pacemaker follow-up: effectiveness, needs, and resources. *Pacing Clin Electrophysiol* 1994;17:1714–1729.
375. Levine PA, Belott PH, Bilitch M *et al.* Recommendations of the NASPE policy conference on pacemaker programmability and follow-up programs. *Pacing Clin Electrophysiol* 1983;6:1222–1223.
376. Levine PA. Proceedings of the Policy Conference of the North American Society of Pacing and Electrophysiology on programmability and pacemaker follow-up programs. *Clin Prog Pacing Electrophysiol* 1984;2:145–191.
377. Fraser J, Gillis A, Irwin M *et al.* Guidelines for pacemaker follow-up in Canada: a consensus statement of the Canadian Working Group on Cardiac Pacing. *Can J Cardiol* 2000;16:355–376.
378. Adamson PB, Smith AL, Abraham WL *et al.* Continuous autonomic assessment in patients with symptomatic heart failure. Prognostic value of heart failure variability measured by an implanted cardiac resynchronization device. *Circulation* 2004;110:2389–2394.
379. Fantoni C, Raffa S, Regoli F *et al.* Cardiac resynchronization therapy improves heart rate profile and heart rate variability of patients with moderate to severe heart failure. *J Am Coll Cardiol* 2005;46:1875–1882.
380. Yu CM, Wang L, Chau E *et al.* Intrathoracic impedance monitoring in patients with heart failure: correlation with fluid status and feasibility of early warning preceding hospitalization. *Circulation* 2005;112:841–848.
381. Kindermann M, Frohlig G, Doerr T *et al.* Optimizing the AV delay in DDD pacemaker patients with high degree AV block: mitral valve Doppler versus impedance. *Pacing Clin Electrophysiol* 1997;20:2453–2462.
382. Bradley K, Desai A, Coman J *et al.* Long term retention of cardiac resynchronization therapy. *J Am Coll Cardiol* 2004;44:72–77.
383. Gras D, Böcker D, Lunati M *et al.*, on behalf of The CARE-HF Study Steering Committee and Investigators. Implantation of cardiac resynchronization therapy systems in the CARE-HF trial: procedural success rate and safety. *Europace* 2007;9:516–522.
384. Chauvin M, Cazeau S, Frank R *et al.* Recommendations from the French Cardiology Society concerning the competence, performance and the environment required for the implantation and surveillance of pacemakers. *Arch Mal Coeur Vaiss* 2006;99:275–278.