

Appendix 3 (as supplied by the authors): List of excluded studies

B.1 Excluded – Wrong Population

- (1) Beshai JF, Grimm RA, Nagueh SF, Baker JH, Beau SL, Greenberg SM et al. Cardiac-resynchronization therapy in heart failure with narrow QRS complexes. *New England Journal of Medicine* 357 (24):2461 -71 , 2007.
- (2) 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. *Journal of the American College of Cardiology* 46 (12):2284 -9 , 2005.

B.2 Excluded – Wrong Intervention and/or Comparator

- (1) A comparison of antiarrhythmic with a defibrillatorrug therapy with implantable defibrillators in patients resuscitated from near-fatal ventricular arrhythmias. The Antiarrhythmics versus Implantable Defibrillators (AVID) Investigators. *New England Journal of Medicine* 337 (22):1576 -83 , 1997.
- (2) Anderson JL, Karagounis LA, Roskelley M, Osborn JS, Handrahan D. Effect of prophylactic antiarrhythmic therapy on time to implantable cardioverter with a defibrillatorefibrillator discharge in patients with ventricular tachyarrhythmias. *American Journal of Cardiology* 73 (9):683 -7 , 1994.
- (3) Auricchio A, Stellbrink C, Sack S, Block M, Vogt J, Bakker P et al. The Pacing Therapies for Congestive Heart Failure (PATH-CHF) study: rationale, design, and endpoints of a prospective randomized multicenter study. *American Journal of Cardiology* 83 (5B):130D -135D, 1999.
- (4) Bansch D, Antz M, Boczor S, Volkmer M, Tebbenjohanns J, Seidl K et al. Primary prevention of sudden cardiac death in idiopathic dilated cardiomyopathy: the Cardiomyopathy Trial (CAT). *Circulation* 105 (12):1453 -8, 2002.
- (5) Bansch D, Steffgen F, Gronefeld G, Wolpert C, Bocker D, Mletzko RU et al. The 1+1 trial: a prospective trial of a dual- versus a single-chamber implantable defibrillator in patients with slow ventricular tachycardias. *Circulation* 110 (9):1022 -9, 2004.
- (6) Bansch D, Kottkamp H, Gronefeld G, Vogt J, Israel C, Bocker D et al. The quick-implantable with a defibrillatorefibrillator trial. *Europace* 9 (12):1144 -50 , 2007.
- (7) Bardy GH, Poole JE, Kudenchuk PJ, Dolack GL, Kelso D, Mitchell R. A prospective randomized repeat-crossover comparison of antitachycardia pacing with low-energy cardioversion. *Circulation* 87 (6):1889 -96, 1993.

- (8) Bardy GH, Lee KL, Mark DB, Poole JE, Packer DL, Boineau R et al. Amiodarone or an implantable cardioverter with a defibrillatorefibrillator for congestive heart failure.[Erratum appears in N Engl J Med. 2005 May 19;352(20):2146]. *New England Journal of Medicine* 352 (3):225 -37, 2005.
- (9) Belardinelli R, Capestro F, Misiani A, Scipione P, Georgiou D. Moderate exercise training improves functional capacity, quality of life, and endothelium with a defibrillatorependent vasodilation in chronic heart failure patients with implantable cardioverter defibrillators and cardiac resynchronization therapy. *European Journal of Cardiovascular Prevention & Rehabilitation* 13(5):818 -25, 2006.
- (10) Bigger JT, Jr. Prophylactic use of implanted cardiac defibrillators in patients at high risk for ventricular arrhythmias after coronary-artery bypass graft surgery. *Coronary Artery Bypass Graft (CABG) Patch Trial Investigators*. *New England Journal of Medicine* 337 (22):1569 -75 , 1997.
- (11) Boriani G, Lubinski A, Capucci A, Niederle R, Kornacewicz-Jack Z, Wnuk-Wojnar AM et al. A multicentre, double-blind randomized crossover comparative study on the efficacy and safety of dofetilide vs sotalol in patients with inducible sustained ventricular tachycardia and ischaemic heart disease. *European Heart Journal* 22 (23):2180 -91, 2001.
- (12) Boriani G, Kranig W, Donal E, Calo L, Casella M, Delarche N et al. A randomized double-blind comparison of biventricular versus left ventricular stimulation for cardiac resynchronization therapy: the Biventricular versus Left Univentricular Pacing with implantable defibrillator Back-up in Heart Failure Patients (B-LEFT HF) trial. *American Heart Journal* 159 (6):1052 -1058 e1, 2010.
- (13) Boriani G, Muller CP, Seidl KH, Grove R, Vogt J, Danschel W et al. Randomized comparison of simultaneous biventricular stimulation versus optimized interventricular delay in cardiac resynchronization therapy. The Resynchronization for the hemodynamic Treatment for Heart Failure Management II implantable cardioverter defibrillator (RHYTHM II implantable defibrillator) study. *American Heart Journal* 151 (5):1050 -8, 2006.
- (14) Brouwer IA, Zock PL, Camm AJ, Bocker D, Hauer RN, Wever EF et al. Effect of fish oil on ventricular tachyarrhythmia and death in patients with implantable cardioverter defibrillators: the Study on Omega-3 Fatty Acids and Ventricular Arrhythmia (SOFA) randomized trial. *JAMA* 295 (22):2613 -9 , 2006.
- (15) Buxton AE, Lee KL, Fisher JD, Josephson ME, Prystowsky EN, Hafley G. A randomized study of the prevention of sudden death in patients with coronary artery disease. Multicenter Unsustained Tachycardia Trial Investigators.[Erratum appears in N Engl J Med 2000 Apr 27;342(17):1300]. *New England Journal of Medicine* 341 (25):1882 -90, 1999.
- (16) Capucci A, Romano S, Puglisi A, Santini M, Pagani M, Cazzin R et al. Dual chamber pacing with optimal AV delay in congestive heart failure: a randomized study. *Europace* 1(3):174 -8 , 1999.

- (17) Connolly SJ, Gent M, Roberts RS, Dorian P, Roy D, Sheldon RS et al. Canadian implantable defibrillator study (CIDS) : a randomized trial of the implantable cardioverter defibrillator against amiodarone. *Circulation* 101 (11):1297 -302 , 2000.
- (18) Connolly SJ, Dorian P, Roberts RS, Gent M, Bailin S, Fain ES et al. Comparison of beta-blockers, amiodarone plus beta-blockers, or sotalol for prevention of shocks from implantable cardioverter defibrillators: the OPTIC Study: a randomized trial. *JAMA* 295 (2):165 -71 , 2006.
- (19) Doll N, Piorkowski C, Czesla M, Kallenbach M, Rastan AJ, Arya A et al. Epicardial versus transvenous left ventricular lead placement in patients receiving cardiac resynchronization therapy: results from a randomized prospective study. *Thoracic & Cardiovascular Surgeon* 56 (5):256 -61 , 2008.
- (20) Dorian P, Philippon F, Thibault B, Kimber S, Sterns L, Greene M et al. Randomized controlled study of detection enhancements versus rate-only detection to prevent inappropriate therapy in a dual-chamber implantable cardioverter with a defibrillatorefibrillator. *Heart Rhythm* 1(5):540 -7 , 2004.
- (21) Doshi RN, Daoud EG, Fellows C, Turk K, Duran A, Hamdan MH et al. Left ventricular-based cardiac stimulation post AV nodal ablation evaluation (the PAVE study). *Journal of Cardiovascular Electrophysiology* 16 (11):1160 -5, 2005.
- (22) Garrigue S, Bordachar P, Reuter S, Jais P, Haissaguerre M, Clementy J. Comparison of permanent left ventricular and biventricular pacing in patients with heart failure and chronic atrial fibrillation: a prospective hemodynamic study. [Review] [46 refs]. *Cardiac Electrophysiology Review* 7 (4):315 -24 , 2003.
- (23) Gasparini M, Anselme F, Clementy J, Santini M, Martinez-Ferrer J, De ST et al. Biventricular versus right ventricular antitachycardia pacing to terminate ventricular tachyarrhythmias in patients receiving cardiac resynchronization therapy: the ADVANCE cardiac resynchronization therapy with a defibrillator Trial. *American Heart Journal* 159 (6):1116 -1123 e2 , 2010.
- (24) Gasparini M, Bocchiardo M, Lunati M, Ravazzi PA, Santini M, Zardini M et al. Comparison of 1-year effects of left ventricular and biventricular pacing in patients with heart failure who have ventricular arrhythmias and left bundle-branch block: the Bi vs Left Ventricular Pacing: an International Pilot Evaluation on Heart Failure Patients with Ventricular Arrhythmias (BELIEVE) multicenter prospective randomized pilot study. *American Heart Journal* 152 (1):155 e1 -7 , 2006.
- (25) Greene HL, Poole JE, Kudenchuk PJ, Dolack GL, Bardy GH, Cobb LA et al. Randomized antiarrhythmic drug therapy in survivors of cardiac arrest (the CASCADE study). *American Journal of Cardiology* 72 (3) (pp 280 -287), 1993;1993.
- (26) Hohnloser SH, Kuck KH, Dorian P, Roberts RS, Hampton JR, Hatala R et al. Prophylactic use of an implantable cardioverter with a defibrillatorefibrillator after acute myocardial infarction. *New England Journal of Medicine* 351 (24):2481 -8 , 2004.

- (27) Hoiyer C-J, Meurling C, Brandt J. Upgrade to biventricular pacing in patients with conventional pacemakers and heart failure: A double-blind, randomized crossover study. *Europace* 8 (1) (pp 51 -55), 2006;Jan.
- (28) Kadish A, Dyer A, Daubert JP, Quigg R, Estes NA, Anderson KP et al. Prophylactic defibrillator implantation in patients with nonischemic dilated cardiomyopathy. *New England Journal of Medicine* 350 (21):2151 -8 , 2004.
- (29) Kalbfleisch SJ, Williamson B, Man KC, Vorperian V, Hummel JD, Hasse C et al. Prospective, randomized comparison of conventional and high dose loading regimens of amiodarone in the treatment of ventricular tachycardia. *Journal of the American College of Cardiology* 22 (6):1723 -9 , 1993.
- (30) Kettering K, Mewis C, Dornberger V, Vonthein R, Bosch RF, Kuhlkamp V. Efficacy of metoprolol and sotalol in the prevention of recurrences of sustained ventricular tachyarrhythmias in patients with an implantable cardioverter defibrillator. *PACE - Pacing and Clinical Electrophysiology* 25 (11) (pp 1571 -1576), 2002;01.
- (31) Kindermann M, Hennen B, Jung J, Geisel J, Bohm M, Frohlig G. Biventricular versus conventional right ventricular stimulation for patients with standard pacing indication and left ventricular dysfunction: the Homburg Biventricular Pacing Evaluation (HOBIPACE). *Journal of the American College of Cardiology* 47 (10):1927 -37 , 2006.
- (32) Kuck K-H, Cappato R, Siebels J, Ruppel R. Randomized comparison of antiarrhythmic drug therapy with implantable defibrillators in patients resuscitated from cardiac arrest: The cardiac arrest study hamburg (CASH). *Circulation* 102 (7) (pp 748 -754), 2000;2000.
- (33) Lau EW, Griffith MJ, Pathmanathan RK, Ng GA, Clune MM, Cooper J et al. The Midlands Trial of Empirical Amiodarone versus Electrophysiology-guided Interventions and Implantable Cardioverter with a defibrillatorefibrillators (MAVERIC): a multi-centre prospective randomised clinical trial on the secondary prevention of sudden cardiac death. *Europace* 6 (4):257 -66 , 2004.
- (34) Leclercq C, Gadler F, Kranig W, Ellery S, Gras D, Lazarus A et al. A randomized comparison of triple-site versus dual-site ventricular stimulation in patients with congestive heart failure. *Journal of the American College of Cardiology* 51 (15):1455 -62 , 2008.
- (35) Leclercq C, Walker S, Linde C, Clementy J, Marshall AJ, Ritter P et al. Comparative effects of permanent biventricular and right-univentricular pacing in heart failure patients with chronic atrial fibrillation. *European Heart Journal* 23(22):1780 -7 , 2002.
- (36) Leclercq C, Cazeau S, Lellouche D, Fossati F, Anselme F, Davy JM et al. Upgrading from single chamber right ventricular to biventricular pacing in permanently paced patients with worsening heart failure: The RD-CHF Study.[Erratum appears in *Pacing Clin Electrophysiol.* 2007 Nov;30(11):1424]. *Pacing & Clinical Electrophysiology* 30 Suppl 1:S23 -30 , 2007.

- (37) Maynard C. Rehospitalization in surviving patients of out-of-hospital ventricular fibrillation (the CASCADE study). *American Journal of Cardiology* 72 (17) (pp 1295 - 1300), 1993;1993.
- (38) Mazur A, Anderson ME, Bonney S, Roden DM. Pause with a defibrillatorependent polymorphic ventricular tachycardia during long-term treatment with dofetilide: A placebo-controlled, implantable cardioverter with a defibrillatorefibrillator-based evaluation. *Journal of the American College of Cardiology* 37 (4) (pp 1100 -1105), 2001;15.
- (39) Mletzko R, Aliot E, Seidl K, Lavergne T, Mabo P, Hohnloser S et al. Safety and efficacy of a dual chamber implantable cardioverter defibrillator capable of slow ventricular tachycardia discrimination: a randomized study. *Pacing & Clinical Electrophysiology* 26 (12):2275 -82 , 2003.
- (40) Moss AJ, Hall WJ, Cannom DS, Daubert JP, Higgins SL, Klein H et al. Improved survival with an implanted defibrillator in patients with coronary disease at high risk for ventricular arrhythmia. Multicenter Automatic Defibrillator Implantation Trial Investigators. *New England Journal of Medicine* 335 (26):1933 -40 , 1996.
- (41) Moss AJ, Zareba W, Hall WJ, Klein H, Wilber DJ, Cannom DS et al. Prophylactic implantation of a defibrillator in patients with myocardial infarction and reduced ejection fraction. *New England Journal of Medicine* 346 (12):877 -83 , 2002.
- (42) Nielsen JC, Bottcher M, Nielsen TT, Pedersen AK, Andersen HR. Regional myocardial blood flow in patients with sick sinus syndrome randomized to long-term single chamber atrial or dual chamber pacing--effect of pacing mode and rate. *Journal of the American College of Cardiology* 35 (6):1453 -61 , 2000.
- (43) Occhetta E, Bortnik M, Magnani A, Francalacci G, Piccinino C, Plebani L 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. *Journal of the American College of Cardiology* 47 (10):1938 -45 , 2006.
- (44) Olshansky B, Day JD, Moore S, Gering L, Rosenbaum M, mcguire M et al. Is dual-chamber programming inferior to single-chamber programming in an implantable cardioverter with a defibrillatorefibrillator? Results of the INTRINSIC RV (Inhibition of Unnecessary RV Pacing with AVSH in IMPLANTABLE defibrillators) study. *Circulation* 115 (1) (pp 9 -16), 2007;Jan.
- (45) Olshansky B, Day J, mcguire M, Hahn S, Brown S, Lerew DR. Reduction of right ventricular pacing in patients with dual-chamber IMPLANTABLE defibrillators. *Pacing & Clinical Electrophysiology* 29 (3):237 -43 , 2006.
- (46) Padeletti L, Musilli N, Porciani MC, Colella A, Di BL, Ricciardi G et al. Atrial fibrillation and cardiac resynchronization therapy: the MASCOT study. *Europace* 5 Suppl 1:S49 -54 , 2004.

- (47) Patwala AY, Woods PR, Sharp L, Goldspink DF, Tan LB, Wright DJ. Maximizing patient benefit from cardiac resynchronization therapy with the addition of structured exercise training: a randomized controlled study. *Journal of the American College of Cardiology* 53 (25):2332 -9 , 2009.
- (48) Piepoli MF, Villani GQ, Corra U, Aschieri D, Rusticali G. Time course of effects of cardiac resynchronization therapy in chronic heart failure: benefits in patients with preserved exercise capacity. *Pacing & Clinical Electrophysiology* 31 (6):701 -8 , 2008.
- (49) Rao RK, Kumar UN, Schafer J, Vilorio E, De LD, Foster E. Reduced ventricular volumes and improved systolic function with cardiac resynchronization therapy: a randomized trial comparing simultaneous biventricular pacing, sequential biventricular pacing, and left ventricular pacing. *Circulation* 115 (16):2136 -44 , 2007.
- (50) Raviele A, Bongiorni MG, Brignole M, Cappato R, Capucci A, Gaita F et al. Early EPS/implantable defibrillator strategy in survivors of acute myocardial infarction with severe left ventricular dysfunction on optimal beta-blocker treatment. The beta-blocker strategy plus implantable defibrillator trial. *Europace* 7 (4):327 -37 , 2005.
- (51) Res JC, Bokern MJ, de Cock CC, van LT, Bronzwaer PN, Spierenburg HA et al. The BRIGHT study: bifocal right ventricular resynchronization therapy: a randomized study. *Europace* 9 (10):857 -61 , 2007.
- (52) Riedlbauchova L, Fridl P, Kautzner J, Peichl P. Performance of left ventricular versus biventricular pacing in chronic heart failure assessed by stress echocardiography. *Pacing & Clinical Electrophysiology* 27 (5):626 -31 , 2004.
- (53) Santini M, Lunati M, Defaye P, Mermi J, Proclemer A, del Castillo-Arroyo S et al. Prospective multicenter randomized trial of fast ventricular tachycardia termination by prolonged versus conventional anti-tachyarrhythmia burst pacing in implantable cardioverter with a defibrillator patients-Atp delivery for painless implantable defibrillator therapy (ADVANCE with a defibrillator) Trial results. *Journal of Interventional Cardiac Electrophysiology* 27 (2):127 -35 , 2010.
- (54) Sawhney NS, Waggoner AD, Garhwal S, Chawla MK, Osborn J, Faddis MN. Randomized prospective trial of atrioventricular delay programming for cardiac resynchronization therapy. *Heart Rhythm* 1(5):562 -7 , 2004.
- (55) Seidl K, Hauer B, Schwick NG, Zahn R, Senges J. Comparison of metoprolol and sotalol in preventing ventricular tachyarrhythmias after the implantation of a cardioverter/defibrillator. *American Journal of Cardiology* 82 (6):744 -8 , 1998.
- (56) Sharma AD, Rizo with a pacemakeratron C, Hallstrom AP, O'Neill GP, Rothbart S, Martins JB et al. Percent right ventricular pacing predicts outcomes in the DAVID trial. *Heart Rhythm* 2(8):830 -4, 2005.

- (57) Siebels J, Kuck K-H. Implantable cardioverter defibrillator compared with antiarrhythmic drug treatment in cardiac arrest survivors (the Cardiac Arrest Study Hamburg). *American Heart Journal* 127 (4 II SUPPL) (pp 1139 -1144), 1994;1994.
- (58) Sirker A, Thomas M, Baker S, Shrimpton J, Jewell S, Lee L et al. Cardiac resynchronization therapy: left or left-and-right for optimal symptomatic effect--the LOLA ROSE study. *Europace* 9 (10):862 -8 , 2007.
- (59) Sirker A, Thomas M, Baker S, Shrimpton J, Jewell S, Lee L et al. Cardiac resynchronization therapy: left or left-and-right for optimal symptomatic effect--the LOLA ROSE study. *Europace : European pacing, arrhythmias, and cardiac electrophysiology : journal of the working groups on cardiac pacing, arrhythmias, and cardiac cellular electrophysiology of the European Society of Cardiology* 9 (10) (pp 862 - 868), 2007;Oct.
- (60) Strickberger SA, Hummel JD, Bartlett TG, Frumin HI, Schuger CD, Beau SL et al. Amiodarone versus implantable cardioverter with a defibrillatorefibrillator: randomized trial in patients with nonischemic dilated cardiomyopathy and asymptomatic nonsustained ventricular tachycardia--AMIOVIRT. *Journal of the American College of Cardiology* 41 (10):1707 -12 , 2003.
- (61) Sweeney MO, Wathen MS, Volosin K, Abdalla I, Degroot PJ, Otterness MF et al. Appropriate and inappropriate ventricular therapies, quality of life, and mortality among primary and secondary prevention implantable cardioverter defibrillator patients: Results from the pacing fast VT reduces shock therapies (painfree Rx II) trial. *Circulation* 111 (22) (pp 2898 -2905), 2005;07.
- (62) Sweeney MO, Shea JB, Fox V, Adler S, Nelson L, Mullen TJ et al. Randomized pilot study of a new atrial-based minimal ventricular pacing mode in dual-chamber implantable cardioverter with a defibrillatorefibrillators. *Heart Rhythm* 1 (2) (pp 160 -167), 2004;Jul.
- (63) Valzania C, Rocchi G, Biffi M, Martignani C, Bertini M, Diemberger I et al. Left ventricular versus biventricular pacing: a randomized comparative study evaluating mid-term electromechanical and clinical effects. *Echocardiography* 25 (2):141 -8 , 2008.
- (64) van G, I, Vernooij K, Delhaas T, Prins MH, Crijns HJ, Prinzen FW et al. Beneficial effects of biventricular pacing in chronically right ventricular paced patients with mild cardiomyopathy. *Europace* 12 (2):223 -9 , 2010.
- (65) Varma C, O'Callaghan P, Rowland E, Mahon NG, Mckenna W, Camm AJ et al. Comparison between biventricular pacing and single site pacing in patients with poor ventricular function: a hemodynamic study. *Pacing & Clinical Electrophysiology* 26 (2 Pt 1):551 -8 , 2003.
- (66) Victor F, Mabo P, Mansour H, Pavin D, Kabalu G, De PC et al. A randomized comparison of permanent septal versus apical right ventricular pacing: short-term results. *Journal of Cardiovascular Electrophysiology* 17(3):238 -42 , 2006.

- (67) Wathen MS, Degroot PJ, Sweeney MO, Stark AJ, Otterness MF, Adkisson WO et al. Prospective randomized multicenter trial of empirical antitachycardia pacing versus shocks for spontaneous rapid ventricular tachycardia in patients with implantable cardioverter with a defibrillatorefibrillators: Pacing Fast Ventricular Tachycardia Reduces Shock Therapies (painless Rx II) trial results. *Circulation* 110 (17):2591 -6 , 2004.
- (68) Weber M, Block M, Bansch D, Castrucci M, Gradaus R, Schriever C et al. Antitachycardia pacing for rapid VT during implantable defibrillator charging: A method to prevent implantable defibrillator shocks. *PACE - Pacing and Clinical Electrophysiology* 24 (3) (pp 345 -351), 2001;2001.
- (69) Wever EF, Hauer RN, Schrijvers G, van Capelle FJ, Tijssen JG, Crijns HJ et al. Cost-effectiveness of implantable defibrillator as first-choice therapy versus electrophysiologically guided, tiered strategy in postinfarct sudden death survivors. A randomized study. *Circulation* 93 (3):489 -96 , 1996.
- (70) Wever EFD, Hauer RNW, Van Capelle FJL, Tijssen JGP, Crijns HJGM, Algra A et al. Randomized study of implantable defibrillator as first-choice therapy versus conventional strategy in postinfarct sudden death survivors. *Circulation* 91 (8) (pp 2195 -2203), 1995;15.
- (71) Wilkoff BL, Ousdigian KT, Sterns LD, Wang ZJ, Wilson RD, Morgan JM et al. A comparison of empiric to physician-tailored programming of implantable cardioverter with a defibrillatorefibrillators: results from the prospective randomized multicenter EMPIRIC trial. *Journal of the American College of Cardiology* 48 (2):330 -9 , 2006.
- (72) Wilkoff BL, Cook JR, Epstein AE, Greene HL, Hallstrom AP, Hsia H et al. Dual-chamber pacing or ventricular backup pacing in patients with an implantable defibrillator: the Dual Chamber and VVI Implantable Defibrillator (DAVID) Trial. *JAMA* 288 (24):3115 -23, 2002.
- (73) Wilkoff BL, Williamson BD, Stern RS, Moore SL, Lu F, Lee SW et al. Strategic programming of detection and therapy parameters in implantable cardioverter with a defibrillatorefibrillators reduces shocks in primary prevention patients: results from the PREPARE (Primary Prevention Parameters Evaluation) study. *Journal of the American College of Cardiology* 52 (7):541 -50 , 2008.
- (74) Wilkoff BL, Dual Chamber and VVI Implantable Defibrillator trial investigators. The Dual Chamber and VVI Implantable Defibrillator (DAVID) Trial: rationale, design, results, clinical implications and lessons for future trials. *Cardiac Electrophysiology Review* 7 (4):468 -72 , 2003.
- (75) Wonisch M, Lercher P, Scherr D, Maier R, Pokan R, Hofmann P et al. Influence of permanent right ventricular pacing on cardiorespiratory exercise parameters in chronic heart failure patients with implanted cardioverter defibrillators. *Chest* 127 (3):787 -93 , 2005.

B.3 Excluded – No Mortality Outcome

- (1) Schlosshan D, Barker D, Lewis N, Pepper C, Tan LB. A mechanistic investigation into how long-term resynchronization therapy confers ongoing cardiac functional benefits and improved exercise capacity. *American Journal of Cardiology* 103 (5):701-8, 2009.
- (2) Yu CM, Lin H, Fung WH, Zhang Q, Kong SL, Sanderson JE. Comparison of acute changes in left ventricular volume, systolic and diastolic functions, and intraventricular synchronicity after biventricular and right ventricular pacing for heart failure. *American Heart Journal* 145 (5):E18, 2003.
- (3) Auricchio A, Stellbrink C, Butter C, Sack S, Vogt J, Misier AR et al. Clinical efficacy of cardiac resynchronization therapy using left ventricular pacing in heart failure patients stratified by severity of ventricular conduction delay. *Journal of the American College of Cardiology* 42 (12):2109 -16 , 2003.

B.4 Excluded – Wrong Study Design

- (1) Albert CM, Rosenthal L, Calkins H, Steinberg JS, Ruskin JN, Wang P et al. Driving and implantable cardioverter with a defibrillatofibrillator shocks for ventricular arrhythmias: results from the TOVA study. *Journal of the American College of Cardiology* 50 (23):2233 -40 , 2007.
- (2) Auricchio A, Stellbrink C, Block M, Sack S, Vogt J, Bakker P et al. Effect of pacing chamber and atrioventricular delay on acute systolic function of paced patients with congestive heart failure. The Pacing Therapies for Congestive Heart Failure Study Group. The Guidant Congestive Heart Failure Research Group. *Circulation* 99 (23):2993 -3001 , 1999.
- (3) Auricchio A, Metra M, Gasparini M, Lamp B, Klersy C, Curnis A et al. Long-term survival of patients with heart failure and ventricular conduction delay treated with cardiac resynchronization therapy. *American Journal of Cardiology* 99 (2):232 -8 , 2007.
- (4) Buckingham TA, Candinas R, Attenhofer C, Van HH, Hug R, Hess O et al. Systolic and diastolic function with alternate and combined site pacing in the right ventricle. *Pacing & Clinical Electrophysiology* 21(5):1077 -84 , 1998.
- (5) Buxton AE, Lee KL, dicarlo L, Gold MR, Greer GS, Prystowsky EN et al. Electrophysiologic testing to identify patients with coronary artery disease who are at risk for sudden death. Multicenter Unsustained Tachycardia Trial Investigators. *New England Journal of Medicine* 342 (26):1937 -45 , 2000.

- (6) Cazeau S, Ritter P, Lazarus A, Gras D, Bakdach H, Mundler O et al. [First experience in treatment of terminal cardiac insufficiency using multisite stimulation]. [French]. *Bulletin de l'Académie Nationale de Médecine* 180 (9):2065 -75 ; discussion 2075;-8.
- (7) Ermis C, Seutter R, Zhu AX, Benditt LC, vanheel L, Sakaguchi S et al. Impact of upgrade to cardiac resynchronization therapy on ventricular arrhythmia frequency in patients with implantable cardioverter with a defibrillatorefibrillators. *Journal of the American College of Cardiology* 46 (12):2258 -63 , 2005.
- (8) Fung JW, Zhang Q, Yip GW, Chan JY, Chan HC, Yu CM. Effect of cardiac resynchronization therapy in patients with moderate left ventricular systolic dysfunction and wide QRS complex: a prospective study. *Journal of Cardiovascular Electrophysiology* 17(12):1288 -92 , 2006.
- (9) Ganz DA, Lamas GA, Orav EJ, Goldman L, Gutierrez PR, Mangione CM. Age-related differences in management of heart disease: a study of cardiac medication use in an older cohort. *Pacemaker Selection in the Elderly (PASE) Investigators. Journal of the American Geriatrics Society* 47 (2):145 -50 , 1999.
- (10) Leclercq C, Cazeau S, Ritter P, Alonso C, Gras D, Mabo P et al. A pilot experience with permanent biventricular pacing to treat advanced heart failure. *American Heart Journal* 140 (6):862 -70 , 2000.
- (11) Leon AR, Abraham WT, Brozena S, Daubert JP, Fisher WG, Gurley JC et al. Cardiac resynchronization with sequential biventricular pacing for the treatment of moderate-to-severe heart failure. *Journal of the American College of Cardiology* 46 (12):2298 -304 , 2005.
- (12) Leon AR, Abraham WT, Curtis AB, Daubert JP, Fisher WG, Gurley J et al. Safety of transvenous cardiac resynchronization system implantation in patients with chronic heart failure: combined results of over 2,000 patients from a multicenter study program. *Journal of the American College of Cardiology* 46 (12):2348 -56 , 2005.
- (13) Nagele H, Bohlmann M, Eck U, Petersen B, Rodiger W. Combination therapy with carvedilol and amiodarone in patients with severe heart failure. *European Journal of Heart Failure* 2(1):71 -9, 2000.
- (14) Higgins SL, Hummel JD, Niazi IK, Giudici MC, Worley SJ, Saxon LA et al. Cardiac resynchronization therapy for the treatment of heart failure in patients with intraventricular conduction delay and malignant ventricular tachyarrhythmias. *Journal of the American College of Cardiology* 42 (8):1454 -9 , 2003.

B.5 Excluded – Sub-study / Sub-analysis / Extension Study

- (1) Alonso C, Ritter P, Leclercq C, Mabo P, Bailleul C, Daubert JC et al. Effects of cardiac resynchronization therapy on heart rate variability in patients with chronic systolic heart

- failure and intraventricular conduction delay. *American Journal of Cardiology* 91 (9):1144 -7 , 2003.
- (2) Aranda JM, Jr., Conti JB, Johnson JW, Petersen-Stejskal S, Curtis AB. Cardiac resynchronization therapy in patients with heart failure and conduction abnormalities other than left bundle-branch block: analysis of the Multicenter insync Randomized Clinical Evaluation (MIRACLE). *Clinical Cardiology* 27 (12):678 -82 , 2004.
 - (3) Auricchio A, Stellbrink C, Sack S, Block M, Vogt J, Bakker P et al. Long-term clinical effect of hemodynamically optimized cardiac resynchronization therapy in patients with heart failure and ventricular conduction delay. *Journal of the American College of Cardiology* 39 (12):2026 -33 , 2002.
 - (4) Carson P, Anand I, O'Connor C, Jaski B, Steinberg J, Lwin A et al. Mode of death in advanced heart failure: the Comparison of Medical, Pacing, and Defibrillation Therapies in Heart Failure (COMPANION) trial.[Erratum appears in *J Am Coll Cardiol.*2008 Jun 3; 51(22): 2197 Note: Ghali, Jalil [corrected to Ghali, Jalal]]. *Journal of the American College of Cardiology* 46 (12):2329 -34 , 2005.
 - (5) Cleland JG, Daubert JC, Erdmann E, Freemantle N, Gras D, Kappenberger L et al. Longer-term effects of cardiac resynchronization therapy on mortality in heart failure [the cardiac resynchronization-Heart Failure (CARE-HF) trial extension phase]. *European Heart Journal* 27 (16):1928 -32 , 2006.
 - (6) Cleland JGF, Daubert JC, Erdmann E, Freemantle N, Gras D, Kappenberger L et al. Baseline characteristics of patients recruited into the CARE-HF study. *European Journal of Heart Failure* 7 (2) (pp 205;02.
 - (7) Duncan A, Wait D, Gibson D, Daubert JC, MUSTIC (Multisite Stimulation in Cardiomyopathies) Trial. Left ventricular remodelling and haemodynamic effects of multisite biventricular pacing in patients with left ventricular systolic dysfunction and activation disturbances in sinus rhythm: sub-study of the MUSTIC (Multisite Stimulation in Cardiomyopathies) trial. *European Heart Journal* 24 (5):430-41, 2003.
 - (8) Fruhwald FM, Fahrleitner with a pacemakerammer A, Berger R, Leyva F, Freemantle N, Erdmann E et al. Early and sustained effects of cardiac resynchronization therapy on N-terminal pro-B-type natriuretic peptide in patients with moderate to severe heart failure and cardiac dyssynchrony. *European Heart Journal* 28 (13):1592 -7 , 2007.
 - (9) Higgins SL, Yong P, Sheck D, mcdaniel M, Bollinger F, Vadecha M et al. Biventricular pacing diminishes the need for implantable cardioverter defibrillator therapy. Ventak CHF Investigators. *Journal of the American College of Cardiology* 36 (3):824 -7 , 2000.
 - (10) Linde C, Braunschweig F, Gadler F, Bailleul C, Daubert JC. Long-term improvements in quality of life by biventricular pacing in patients with chronic heart failure: results from the Multisite Stimulation in Cardiomyopathy study (MUSTIC). *American Journal of Cardiology* 91 (9):1090 -5, 2003.

- (11) St John Sutton MG, Plappert T, Abraham WT, Smith AL, delurgio DB, Leon AR et al. Effect of cardiac resynchronization therapy on left ventricular size and function in chronic heart failure. *Circulation* 107 (15):1985 -90 , 2003.
- (12) St John Sutton MG, Plappert T, Hilpisch KE, Abraham WT, Hayes DL, Chinchoy E. Sustained reverse left ventricular structural remodeling with cardiac resynchronization at one year is a function of etiology: Quantitative Doppler echocardiographic evidence from the Multicenter insync Randomized Clinical Evaluation (MIRACLE). *Circulation* 113 (2) (pp 266 -272), 2006;Jan.
- (13) St John SM, Ghio S, Plappert T, Tavazzi L, Scelsi L, Daubert C et al. Cardiac resynchronization induces major structural and functional reverse remodeling in patients with New York Heart Association class I/II heart failure. *Circulation* 120 (19):1858 -65 , 2009.
- (14) Varma C, Sharma S, Firoozi S, mckenna WJ, Daubert JC, Multisite Stimulation in Cardiomyopathy (MUSTIC) Study Group. Atrioventricular pacing improves exercise capacity in patients with heart failure and intraventricular conduction delay. *Journal of the American College of Cardiology* 41 (4):582 -8 , 2003.
- (15) Vogt J, Krahnefeld O, Lamp B, Hansky B, Kirkels H, Minami K et al. Electrocardiographic remodeling in patients paced for heart failure. *American Journal of Cardiology* 86 (9A):152K -156K , 2000.
- (16) Woo GW, Petersen-Stejskal S, Johnson JW, Conti JB, Aranda JA, Jr., Curtis AB. Ventricular reverse remodeling and 6-month outcomes in patients receiving cardiac resynchronization therapy: analysis of the MIRACLE study. *Journal of Interventional Cardiac Electrophysiology* 12 (2):107 -13, 2005.
- (17) Daubert C, Gold MR, Abraham WT, Ghio S, Hassager C, Goode G et al. Prevention of disease progression by cardiac resynchronization therapy in patients with asymptomatic or mildly symptomatic left ventricular dysfunction: insights from the European cohort of the REVERSE (Resynchronization Reverses Remodeling in Systolic Left Ventricular Dysfunction) trial. *Journal of the American College of Cardiology* 54 (20):1837-46, 2009.

B.6 Excluded – Protocol / Rationale

- (1) Abraham WT. Rationale and design of a randomized clinical trial to assess the safety and efficacy of cardiac resynchronization therapy in patients with advanced heart failure: the Multicenter insync Randomized Clinical Evaluation (MIRACLE). *Journal of Cardiac Failure* 6 (4):369 -80, 2000.
- (2) Beshai JF, Grimm R. The resynchronization therapy in narrow QRS study (rethink study): methods and protocol design.[Erratum appears in *J Interv Card Electrophysiol*. 2008 Jan;21(1):69]. *Journal of Interventional Cardiac Electrophysiology* 1919;(3):149-155.

- (3) Bristow MR, Feldman AM, Saxon LA. Heart failure management using implantable devices for ventricular resynchronization: Comparison of Medical Therapy, Pacing, and Defibrillation in Chronic Heart Failure (COMPANION) trial. COMPANION Steering Committee and COMPANION Clinical Investigators. *Journal of Cardiac Failure* 6 (3):276 -85, 2000.
- (4) Cappato R, Bongiorni MG, Brignole M, Capucci A, Gaita F, Mangiameli S et al. The best + implantable defibrillator trial. *Herzschrittmachertherapie und Elektrophysiologie* 10 (SUPPL 2) (pp 15 -22), 1999;1999.
- (5) Cleland JGF, Daubert JC, Erdmann E, Freemantle N, Gras D, Kappenberger L et al. The CARE-HF study (cardiac resynchronisation in heart failure study): Rationale, design and end with a pacemakeroints. *European Journal of Heart Failure* 3 (4) (pp 481 -489), 2001.
- (6) De Lurgio DB, Foster E, Higginbotham MB, Larntz K, Saxon LA. A comparison of cardiac resynchronization by sequential biventricular pacing and left ventricular pacing to simultaneous biventricular pacing: rationale and design of the DECREASE-HF clinical trial. *Journal of Cardiac Failure* 11(3):233 -9, 2005.
- (7) Hamdan MH, Freedman RA, Gilbert EM, dimarco JP, Ellenbogen KA, Page RL. Atrioventricular junction ablation followed by resynchronization therapy in patients with congestive heart failure and atrial fibrillation (AVERT-AF) study design. *Pacing & Clinical Electrophysiology* 29 (10):1081 -8, 2006.
- (8) Hohnloser SH, Connolly SJ, Kuck KH, Dorian P, Fain E, Hampton JR et al. The defibrillator in acute myocardial infarction trial (DINAMIT): study protocol. *American Heart Journal* 140 (5):735 -9, 2000.
- (9) Kadish A, Quigg R, Schaechter A, Anderson KP, Estes M, Levine J. Defibrillators in nonischemic cardiomyopathy treatment evaluation. *Pacing & Clinical Electrophysiology* 23(3):338 -43, 2000.
- (10) Leclercq C, Ansalone G, Gadler F, Boriani G, Perez-Castellano N, Grubb N et al. Biventricular versus Left univentricular pacing in heart failure: rationale, design, and endpoints of the B-LEFT HF study. *Europace* 8 (1):76 -80, 2006.
- (11) Lenarczyk R, Kowalski O, Sredniawa B, Pruszkowska-Skrzep P, Pluta S, Sokal A et al. Triple-site versus standard cardiac resynchronization therapy study (TRUST cardiac resynchronization therapy): clinical rationale, design, and implementation. *Journal of Cardiovascular Electrophysiology* 1920;(6):658-662.
- (12) Linde C, Gold M, Abraham WT, Daubert JC, REVERSE Study Group. Rationale and design of a randomized controlled trial to assess the safety and efficacy of cardiac resynchronization therapy in patients with asymptomatic left ventricular dysfunction with previous symptoms or mild heart failure--the resynchronization reverses Remodeling in Systolic left ventricular dysfunction (REVERSE) study. *American Heart Journal* 151 (2):288 -94, 2006.

- (13) Moss AJ, Brown MW, Cannom DS, Daubert JP, Estes M, Foster E et al. Multicenter automatic defibrillator implantation trial-cardiac resynchronization therapy (MADIT-cardiac resynchronization therapy): design and clinical protocol. *Annals of Noninvasive Electrocardiology* 10(4 Suppl):34 -43, 2005.
- (14) Stellbrink C, Auricchio A, Butter C, Sack S, Vogt J, Bocker D et al. Pacing Therapies in Congestive Heart Failure II study. *American Journal of Cardiology* 86 (9A):138K -143K, 2000.

B.7 Excluded - Review

- (1) Aronow WS. Cardiac resynchronization therapy plus implantable defibrillator in congestive heart failure. Use of cardiac resynchronization therapy and an implantable cardioverter with a defibrillatorefibrillator in heart failure patients with abnormal left ventricular dysfunction. *Geriatrics* 60 (2):24, 26 -8, 2005.
- (2) Blanc JJ, Etienne Y, Gilard M, Mansourati J. [Left ventricular stimulation in treatment of heart failure]. [Review] [26 refs] [French]. *Presse Medicale* 29 (32):1788 -92, 2000.
- (3) Oseroff O, Retyk E, Bochoeyer A. Subanalyses of secondary prevention implantable cardioverter with a defibrillatorefibrillator trials: antiarrhythmics versus implantable defibrillators (AVID), Canadian Implantable Defibrillator Study (CIDS), and Cardiac Arrest Study Hamburg (CASH). [Review] [23 refs]. *Current Opinion in Cardiology* 1919;(1):26-30.