

## Scientific Study References

HeartSine Technologies are a world leader in personal and public access cardiac rhythm management, our mission is to advance the deployment of lifesaving defibrillation therapy in non-traditional areas of care through the development of proprietary technologies and quality products.

Time is critical in the event of Sudden Cardiac Arrest. More than 84% of all incidents occur in non-medical locations (either in the home or in a public place). As a result, our sole purpose is to design and manufacture an affordable defibrillator for the non-medical consumer that is lightweight, portable, and easy to use.

HeartSine® products are a commitment to excellence, designed to deliver:

- outstanding clinical efficacy based on over 40 years of expertise
- unsurpassed reliability
- integrated information management
- ease of use
- a cost effective solution
- solutions specific to public access use

Here you will find a list of studies completed both internally by the Belfast Research Group and externally by others which relate to HeartSine's life saving technology.

In 2010 HeartSine Technologies introduced the new HeartSine samaritan® PAD 500P with CPR advisor. The HeartSine samaritan® PAD 500P has all the advantages of our well-known samaritan® 300P device with the addition of a CPR advisor which will provide the user with feedback such as ‘Push Harder’, ‘Push Faster’ or ‘Push Slower’ offering the operator a step-by-step guide through the resuscitation process.

For further information and in-depth knowledge of CPR and ICG, the following articles are easily accessible through the web and highly recommended.

#### CPR Related:

- Quality and efficiency of bystander CPR. Belgian Cerebral Resuscitation Study Group, Van Hoeyweghen RJ, Bossaert LL et al. *Resuscitation*. 26(1):47-52, 1993
- Influence of Cardiopulmonary Resuscitation Prior to Defibrillation in Patients With Out-of-Hospital Ventricular Fibrillation, L Cobb, C Fahrenbruch, Lt T Walsh, M Copass, M Olsufka, M Breskin, A Hallstrom. *JAMA*. 281, 1182-1188, 1999
- Increasing Use of Cardiopulmonary Resuscitation During Out-of-Hospital Ventricular Fibrillation Arrest: Survival Implications of Guideline Changes, Rea et al. *Circulation*.114, 2760-2765, 2006
- Quality of out-of-hospital cardiopulmonary resuscitation with real time automated feedback: A prospective interventional study, J Kramer-Johansen, H Myklebust, L Wik, B Fellows, L Svensson, H Sjørebø, P Steen. *Resuscitation*. 71, 283-292, 2006

#### ICG Related:

- Impedance Cardiography as a non invasive method of monitoring cardiac function and other parameters of the cardiovascular system. W. G. Kubicek, R. P. Patterson, D. A. Witsoe. *Annals of the New York Academy of Sciences*. Volume 170 Issue International Conference on Bioelectric Impedance, Pages 724 – 732, 1970.
- Cardiac output measured by transthoracic impedance cardiography at rest, during exercise and at various lung volumes. Edmunds AT, Godfrey S, Tooley M. *Clinical Science* 63, (107–113), 1982
- Clinical evaluation of impedance cardiography. D. S. Goldstein, R. O. Cannon III, R. Zimlichman, H. R. Keiser. *Clinical Physiology and Functional Imaging*. Volume 6 Issue 3, Pages 235 – 251, 1986
- Impedance Cardiography, Joseph M. Van De Water, Timothy W. Miller, Robert L. Vogel, Bruce E. Mount, Martin L. Dalton, *Chest* vol. 123, 2028-2033, 2003

For further reading on topics related to Defibrillation therapy, please see the publications index below

## BIPHASIC DEFIBRILLATION STUDIES

*HeartSine samaritan® PAD 300P/PAD 500P*

### *Belfast Research Group*

1989 Electrode pad size, transthoracic impedance and success of external ventricular defibrillation  
Dalzell GW, Cunningham SR, Anderson J, et al Am J Cardiol 64:741–744 Oct 1989

1999 Rounded Biphasic Waveform Lowers Threshold for Transthoracic Ventricular Defibrillation  
Kidwai, J D Allen, A McIntyre, J Anderson, A A J Adgey PACE 2 (4:II), 872

2000 Optimization of rounded biphasic waveforms to reduce threshold for transthoracic ventricular defibrillation.  
Kidwai B, Allen D, McIntyre A, Anderson J, Adgey J. Pacing Clin Electrophysiol, 23, 745

2002 Optimization of transthoracic ventricular defibrillation-biphasic and triphasic shocks, waveform rounding, and synchronized shock delivery  
Bakhtiar J. Kidwai, Allister McIntyre, John Anderson, A.A.Jennifer Adgey JEC. Volume 35, Issue 3, Pages 235-244

### *Others*

1997 Low-Energy Impedance-Compensating Biphasic Waveforms Terminate Ventricular Fibrillation at High Rates in Victims of Out-of-Hospital Cardiac Arrest  
J Poole, R White, K-G Kanz, Friederike Hengstenberg, G Truett Jarrard JCE Vol 8; 12, 1373 - 1385

1998 Treatment of out-of-hospital cardiac arrest with a low-energy impedance-compensating biphasic waveform automatic external defibrillator  
Gliner BE, Jorgenson DB, Poole JE et al Biomed Instrum Technol. 32(6):631-44.

1999 Comparison of a Novel Rectilinear Biphasic Waveform With a Damped Sine Wave Monophasic Waveform for Transthoracic Ventricular Defibrillation  
Suneet Mittal, Shervin Ayati, Kenneth M. Stein J Am Coll Cardiol. Vol. 34, No. 5

1999 The Effects of Biphasic and Conventional Monophasic Defibrillation on Postresuscitation Myocardial Function  
Wanchun Tang, Max Harry Weil, Shijie Sun, Hitoshi Yamaguchi, Heitor P. Povoas, Andreja Marn Pernat, Joe Bisera, J Am Coll Cardiol. Vol. 34, No. 3

2000 Multicenter, Randomized, Controlled Trial of 150-J Biphasic Shocks Compared With 200- to 360-J Monophasic Shocks in the Resuscitation of Out-of-Hospital Cardiac Arrest Victims  
Schneider T, Martens PR, Paschen H Circulation 2000; 102:1780 –7

2000 Transthoracic monophasic and biphasic defibrillation in a swine model: a comparison of efficacy, ST segment changes, and postshock hemodynamics  
James T. Niemann, Daniel Burian, Daniel Garner, Roger J. Lewis Resuscitation. 47; 51-58

2000 Biphasic shocks are superior to monophasic for human transthoracic defibrillation S. C. Faddy, J. Powell, J. C. Craig Heart, Lung and Circulation. 9; 3; A148

2001 Patient outcomes following defibrillation with a low energy biphasic truncated exponential waveform in out-of-hospital cardiac arrest Roger D. White, Daniel G. Hankins and Elizabeth J. Atkinson Resuscitation. 49; 9-14

2003 A prospective, randomised and blinded comparison of first shock success of monophasic and biphasic waveforms in out-of-hospital cardiac arrest Anouk van Alem, Fred W. Chapman, Paula Lank, Augustinus A.M. Hart Resuscitation 58 17-24

2003 Biphasic and monophasic shocks for transthoracic defibrillation: a meta analysis of randomised controlled trials Steven C. Faddy, Jane Powell, Jonathan C. Craig Resuscitation 58 9-16

2003 Do clinically relevant transthoracic defibrillation energies cause myocardial damage and dysfunction? Charles D. Deakin, Jonathan J.S. Ambler Resuscitation 59 59-70

## LOW ENERGY DEFIBRILLATION

*HeartSine samaritan® PAD 300P/PAD 500P*

### *Belfast Research Group*

2004 Efficacy of Distinct Energy Delivery Protocols Comparing Two Biphasic Defibrillators for Cardiac Arrest Walsh SJ, McClelland AJJ, Owens CG, Allen J, Anderson J McC., Turner C, A.A. Jennifer AdgeyAm J Cardiol. 94:378–380

### *Others*

2004 Multicenter Study of Safety and Efficacy of a Biphasic Impedance-Compensating Waveform for Transthoracic Defibrillation Randall Fincke, Charles I. Haffajee, David M. Barash, Francesco Fedele, Henry R. Halperin J Am Coll Cardiol.43, Supp. 2; A299-A300

2006 Post-shock myocardial stunning: A prospective randomised double-blind comparison of monophasic and biphasic waveforms Charles D. Deakin, Jonathan J.S. Ambler Resuscitation 68, 329—333

2006 Transthoracic Incremental Monophasic Versus Biphasic Defibrillation by Emergency Responders (TIMBER) Kudenchuk et al. Circulation. 114, 2010-2018

2006 A randomised controlled trial of efficacy and ST change following use of the Welch-Allyn MRL PIC biphasic waveform versus damped sine monophasic waveform for external DC cardioversion Ambler JJS, Deakin CD Resuscitation. 71: 146-151

2008 Superiority of Biphasic over Monphasic defibrillation shocks is attributable to less intracellular calcium transient heterogeneity; Gyo-Seung Hawng, Liang Tang, Boyoung JoungJ Am Coll Cardiol. Vol. 52; 828-835.

*HeartSine® Personal Defibrillation Unit PDU 400*

### *Belfast Research Group*

2007 A novel low-tilt biphasic waveform is efficacious with significantly lower voltage and current than a standard waveform in the defibrillation of VF Darragh KM, Doyle C, Walsh SJ, Allen JD, Adgey AAJ, Anderson J, Manoharan G Journal of Electrocardiology 40; S30–S36

2009 A novel low tilt waveform for the defibrillation of ventricular arrhythmias during cardiac arrest Darragh KM, Bennett JR, Manoharan G, Walsh SJ, Di Maio R, Allen JD, Anderson JMCC, Adgey AAJ Europace (2009) 11 (suppl 2)

## ICG-VT DETECTION ALGORITHM

*HeartSine® Personal Defibrillation Unit PDU 400*

### *Belfast Research Group*

1998 The transthoracic impedance cardiogram is a potential haemodynamic sensor for an automated external defibrillator Johnston PW, Imam Z, Dempsey G, Anderson J, Adgey AAJ European Heart J. 1998; 19 (12): 1879-1888

2008 The impedance cardiogram recorded through two electrocardiogram/defibrillator pads as a determinant of cardiac arrest during experimental studies. Cromie, Nick Alexander; Allen, John Desmond; Turner, Colin; Anderson, John McC; Adgey, A A. Jennifer. Critical Care Medicine. 36(5):1578-1584

2008 The impedance cardiogram recorded through two electrocardiogram/defibrillator pads as a determinant of cardiac arrest during experimental studies. Cromie, NA, Allen, JD; Turner, C; Anderson, JMCC , Adgey, AAJ Critical Care Medicine, 36: 1578-1584

## **PUBLIC ACCESS DEFIBRILLATION**

*HeartSine samaritan® PAD 300P/PAD 500P*

### ***Belfast Research Group***

2008 The Northern Ireland Public Access Defibrillation (NIPAD) study: effectiveness in urban and rural populations M J Moore, A J Hamilton, K J Cairns, et al *Heart* 94:1614-1619

### ***Others***

1998 Public Locations of Cardiac Arrest Implications for Public Access Defibrillation L Becker, M Eisenberg et al *Circulation*. 97, 2106-2109.

1998 Potential Cost-effectiveness of Public Access Defibrillation in the United States G Nichol, A Hallstrom et al *Circulation*. 97, 1315-1320

1999 Public-access defibrillation J Ornato, D Hankins et al *Prehosp Emerg Care*. Vol. 3, 297 - 302

1999 Public-access defibrillation: Where do we place the aeds? M Gratton, D Lindholm et al *Prehosp Emerg Care*, Vol. 3, 303 - 305

2001 Technologic advances and program initiatives in public access defibrillation using automated external defibrillators White, R Curr Opin in Crit Care. Vol. 7, 145-151

2003 Public access defibrillation in Helsinki: Costs and potential benefits from a community-based pilot study M Kuisma, M Castrén, K Nurminen *Resuscitation*. Vol. 56, 149-152 PAD 300P/500P

2004 Public-access defibrillation and survival after out-of-hospital cardiac arrest. Hallstrom AP, Ornato JP et al *N Engl J Med*. Vol.12, 637-46.

2004 Public Access Defibrillation in Out-of-Hospital Cardiac Arrest A Community-Based Study L Culley, T Rea, J Murray et al *Circulation*. Vol. 109, 1859-1863

2008 Results from Austria's nationwide public access defibrillation (ANPAD) programme collected over 2 years R Fleischhackl, B Roessler et al *Resuscitation*. Vol. 77, 195-200

2008 A national scheme for public access defibrillation in England and Wales: Early results M Colquhoun, D Chamberlain et al *Resuscitation*. Vol. 78, 275-280

2009 Public Access Defibrillation R Rho, R Page *Cardiac Electrophysiol Clin*. Vol. 1, 33-40

**BYSTANDER CPR/COMPRESSIONS/ICG-ANALYSIS**

*HeartSine samaritan® PAD 500P*

1976 Cardiopulmonary Resuscitation by lay people Ivar Lund and Andreas Skulberg Vol. 308, 702-704

1979 Bystander-Initiated Cardiopulmonary Resuscitation in the Management of Ventricular Fibrillation R Thompson, A Hallstrom, L Cobb AIM. 90, 737-740

1981 Mechanisms of Blood Flow During Cardiopulmonary Resuscitation M Rudikoff; W Maugha, M Effron, P Freund, M Weisfeldt SOA. Vol.25, Issue 2

1985 Survival of out-of-hospital cardiac arrest with early initiation of cardiopulmonary resuscitation R Cummins, M Eisenberg, A Hallstrom, Paul E. Litwin The Am J of Emerg Med. Vol. 3, 114-119

1985 Prehospital Cardiopulmonary Resuscitation R Cummins, M Eisenberg JAMA. 253, 2408-2412.

1989 Bystander cardiopulmonary resuscitation (CPR) in out-of-hospital cardiac arrest. The Cerebral Resuscitation Study Group Bossaert and Van Hoeyweghen et al. Resuscitation. 17 Suppl:S55-69

1989 The effect of bystander CPR on neurologic outcome in survivors of prehospital cardiac arrests Troiano P, Masaryk J, Stueven HA, Olson D, Barthell E, Waite EM. Resuscitation, 17, 1, 91-98

1993 Quality and efficiency of bystander CPR. Belgian Cerebral Resuscitation Study Group Van Hoeyweghen RJ, Bossaert LL et al. Resuscitation. 26(1):47-52.

1994 Quality of bystander cardiopulmonary resuscitation influences outcome after prehospital cardiac arrest L Wik, P Steen, Nicholas Bircher Resuscitation. 28, 195-203

1995 Effectiveness of bystander cardiopulmonary resuscitation and survival following out-of-hospital cardiac arrest. Gallagher EJ, Lombardi G, Gennis P. JAMA. 27;274(24):1922-5.

1997 Quality of mechanical, manual standard and active compression–decompression CPR on the arrest site and during transport in a manikin model K Sunde, Lars Wik, P Steen Resuscitation. Vol.34, 235-24

1999 Influence of Cardiopulmonary Resuscitation Prior to Defibrillation in Patients With Out-of-Hospital Ventricular Fibrillation L Cobb, C Fahrenbruch, Lt T Walsh, M Copass JAMA. 281, 1182-1188.

2000 Cardiopulmonary Resuscitation by Chest Compression Alone or with Mouth-to-Mouth Ventilation A Hallstrom, L Cobb, E Johnson, and M Copass NEJM. 342, 1546-1553

2000 Effect of bystander cardiopulmonary resuscitation in out-of-hospital cardiac arrest patients in Sweden Mikael Holmberg, Stig Holmberg, Johan Herlitz Resuscitation. 47, 59–70



2003 Rediscovering the importance of chest compressions to improve the outcome from cardiac arrest. L Wik Resuscitation. 58, 267-9.

2003 Evaluation of a defibrillator-basic cardiopulmonary resuscitation programme for non medical personnel Lars Wik, Elizabeth Dorph, Bjørn Auestad, Petter Andreas Steen Resuscitation 56, 167-172

2003 The critical importance of minimal delay between chest compressions and subsequent defibrillation: a haemodynamic explanation Steen S, Liao Q, Pierre L, Paskevicius A, Sjöberg Resuscitation. 58(3):249-58

#### **BYSTANDER CPR STUDIES: CPR-ADVISOR**

*HeartSine samaritan® PAD 500P (Studies applying to the samaritan® PAD 300P also are marked\*)*

#### ***Belfast Research Group***

1986 Automatic Detection of Cardiac Arrest Rhythms. J Anderson, E Hunter, C Jack & J Adgey  
Published JACC, Supplement A, p190A\*

1986 Frequency Analysis of Ventricular Fibrillation and Synchronised Defibrillation in the Dog Heart.  
Adgey, J Allen, J Anderson, A Bailey Proceedings of the Physiological Society, p37 \*

1986 Comparison of the Dominant Frequency of Ventricular Fibrillation, Induced Under Different Conditions in the Anaesthetised Dog. J Adgey, J Allen, J Anderson, E Carlisle Journal of Physiology, 24, p381\*

1986 Low Frequency Spectral Analysis of Ventricular Fibrillation. E Carlisle, J Anderson, J Allen, J Adgey Abstracts Vol 10, p291\*

1987 Accuracy in the Automatic Detection of Ventricular Fibrillation. J Anderson, G Dalzell, J Adgey, O Beggs JACC 9, p206-208\*

1987 Automatic Detection of Ventricular Fibrillation. J Adgey, G Dalzell, S Cunningham, J Anderson & H Magee Pacing and Clinical Electrophysiology 10, p663-665\*

1987 Transthoracic Impedance in Cardiac Arrest. J Anderson, G Dalzell, H Magee, J Adgey European Heart Journal 8, Suppl 2, p58-62

1988 Human Transthoracic Impedance - Role of Skinfold Thickness and Body Fat. H Magee, J Anderson, S Cunningham, G Dalzell Pacing and Clinical Electrophysiology 11, p856-858

1989 Accuracy of a Semi-automatic Defibrillator During Cardiac Arrests W Dickey, G Dalzell, O Beggs, J Anderson, J Adgey British Heart Journal, p.37-39\*

1989 Clinical Decision Making of a Semi-automatic Defibrillator. W Dickey, G Dalzell, J Anderson, A Bailey, J Adgey Irish Journal of Med \*

- 1993 Detection of Shockable Ventricular Tachyarrhythmias Using Transthoracic Impedance Cardiography P W Johnston, J D Allen, G J Dempsey, J Jossinet, Z Imam, J Anderson, A A J Adgey European Heart Journal: XVth Congress of the European Society of Cardiology, Vol 14, 2330, August, 1993
- 1993 Use of the Transthoracic Impedance Cardiogram as a Haemodynamic Indicator in Ventricular Tachyarrhythmias P W Johnston, D Allen, G J Dempsey, J Jossinet, J Anderson, A A J Adgey, Z Imam Pacing and Clinical Electrophysiology, 16, 5 p1162-1166
- 1995 Improving the Accuracy of an Automated External Defibrillator P W Johnston, J Anderson, A A J Adgey Eur Heart J 16 (Suppl) 398, 2246\*
- 1994 Detection of Shockable Ventricular Tachycardia by Impedance Cardiography using 2 ECG/Defibrillator Pads P W Johnston, J D Allen, G Dempsey, J Jossinet, Z Imam, J Anderson, A A J Adgey. Irish Journal of Medical Science, 163, 398
- 1995 The Potential Use of Impedance Cardiography as a Haemodynamic Sensor for Automated External Defibrillators P W Johnston, J Anderson, A A J Adgey Irish Journal of Medical Science 164, p.69-73
- 1998 The transthoracic impedance cardiogram is a potential haemodynamic sensor for an automated external defibrillator Johnston PW, Imam Z, Dempsey G, Anderson J, Adgey AAJ European Heart J. 1998; 19 (12): 1879-1888
- 2003 The impedance cardiogram recorded through two defibrillator pads is a potential haemodynamic sensor of ventricular fibrillation Cromie N, Allen JD, McIntyre A, Scott T, Allen J, Anderson JMCC, Adgey AAJ Cardiac arrhythmias: clinical issues p340
- 2004 Fast Fourier Transformation of the Impedance Cardiogram Recorded Through Two Defibrillator Pads is a Powerful Determinant of Cardiac Arrest in the Porcine Model Cromie N, Allen JD, Moore M, Glover B, Di Maio R, Allen J, Anderson JMCC, Adgey AAJ Circulation, 110 suppl III – 342
- 2006 The Impedance Cardiogram recorded through the novel configuration of two defibrillator/electrocardiogram pads provides a powerful determinant of cardiac arrest Cromie NA., Allen J., Anderson J., Adgey A Heart, vol. 92(Supplement II):A4–A121
- 2008 The impedance cardiogram recorded through two electrocardiogram/defibrillator pads as a determinant of cardiac arrest during experimental studies. Cromie, Nick Alexander; Allen, John Desmond; Turner, Colin; Anderson, John McC; Adgey, A A. Jennifer. Critical Care Medicine. 36(5):1578-1584

2008 The impedance cardiogram recorded through two electrocardiogram/defibrillator pads as a determinant of cardiac arrest during experimental studies. Cromie, NA, Allen, JD; Turner, C; Anderson, JMcC, Adgey, AAJ *Critical Care Medicine*, 36: 1578-1584

2009 Transthoracic Impedance Cardiography: A Non invasive Method of Hemodynamic Assessment Melike Bayram, Clyde W. Yancy *Heart Failure Clinics*, Volume 5, Issue 2, Pages 161-168

2009 The use of impedance cardiography in automatic external defibrillators to discriminate between shockable and nonshockable ventricular tachycardia in real time Di Maio R, Navarro C., Cromie N.A., Anderson J.M.C, Adgey A.A.J *Journal of Electrocardiology* 4: 609

2010 Assessment of the impedance cardiogram recorded by an automated external defibrillator during clinical cardiac arrest. Cromie, N A; Allen, J D; Navarro, C; Turner, C; Anderson, J McC; Adgey, AAJ *Critical Care Medicine* 38(2):510-517

2010 The Impedance Cardiogram is an indicator of CPR effectiveness for out-of-hospital cardiac arrest victims Rebecca C. Di Maio, Cesar Navarro, Nicholas Cromie, John McC Anderson, Jennifer AJ Adgey J *Am Coll Cardio*, Vol 55, Issue 10, Supp 1, Page A217

### *Others*

2003 Delaying defibrillation to give basic cardiopulmonary resuscitation to patients with out-of-hospital ventricular fibrillation: a randomized trial Wik L, Hansen TB, Fylling F, Steen T et al *JAMA*. 289(11):1389-95.

2003 Improving CPR Performance using an Audible Feedback System Suitable for Incorporation into an Automated External Defibrillator Handley JA et al *Resuscitation*. Volume 57 Issue 1, Pages 57-62

2005 Cost-effectiveness of training unselected laypersons in cardiopulmonary resuscitation and defibrillation P Groeneveld, D Owens *The Amer Journ of Med*.

118, 58-67 PAD 500P 2005 Quality of Cardiopulmonary Resuscitation During Out-of-Hospital Cardiac Arrest L Wik, J Kramer Johansen, H Myklebust, H Sjørebø, L Svensson, B Fellows, P Steen *JAMA*. 293, 299-304.

2006 Quality of out-of-hospital cardiopulmonary resuscitation with real time automated feedback: A prospective interventional study J Kramer-Johansen, H Myklebust, L Wik, B Fellows, L Svensson, H Sjørebø, P Steen *Resuscitation*. 71, 283-292

2006 Increasing Use of Cardiopulmonary Resuscitation During Out-of-Hospital Ventricular Fibrillation Arrest: Survival Implications of Guideline Changes Rea et al. *Circulation*. 114, 2760-2765.

- 2007 Does compression-only cardiopulmonary resuscitation generate adequate passive ventilation during cardiac arrest? C Deakin, J O'Neill, T Tabor Resuscitation. 75, 53—59
- 2008 Quality of cardiopulmonary resuscitation before and during transport in out-of-hospital cardiac arrest T Olasveengena, L Wik, P Steen Resuscitation. 76, 185—190
- 2008 Minimally Interrupted Cardiac Resuscitation by Emergency Medical Services or Out-of-Hospital Cardiac Arrest Bobrow et al. JAMA. 299, 1158-1165.
- 2009 Defibrillation and the quality of layperson cardiopulmonary resuscitation: Dispatcher assistance or training? H Harvea, J Jokela, A Tissari, A Saukko, T Okkolin, V Pettilä, T Silfvast Resuscitation. 80, 275–277
- 2010 Cardiac arrest in the catheterisation laboratory: A 5-year experience of using mechanical chest compressions to facilitate PCI during prolonged resuscitation efforts H Wagner, C Terkelsen, H Friberg, J Harnek, K Kern, J Flensted Lassen, G Olivecrona Resuscitation. 81, 383-387
- 2010 Continuous chest compression CPR preferred for primary cardiac arrest Ewy G, Sanders AB Resuscitation. 81, 639-40.
- 1970 Impedance Cardiography as a non invasive method of monitoring cardiac function and other parameters of the cardiovascular system W. G. Kubicek, R. P. Patterson, D. A. Witsoe Annals of the New York Academy of Sciences. Volume 170; pp 724 - 732
- 1982 Cardiac output measured by transthoracic impedance cardiography at rest, during exercise and at various lung volumes Edmunds AT, Godfrey S, Tooley M Clinical Science 63, (107–113) PAD 500P
- 1986 Clinical evaluation of impedance cardiography D. S. Goldstein, R. O. Cannon III, R. Zimlichman, H. R. Keiser Clin Phys and Func Imag. Vol 6 Issue 3, pp 235 - 251
- 1990 Impedance cardiography for cardiac output measurement: An evaluation of accuracy and limitations S. W. White, A. W. Quail, P. W. De Leeuw Eur Heart J. 11 (suppl I): 79-92.
- 1991 Reliability of impedance cardiography in measuring central haemodynamics J. Mehlsen, J. Bonde, C. Stadeager, M. Rehling, M. Tangø, J. Trap-Jensen Clin Phys and Func Imag. Vol 11 Issue 6, pp 579 - 588
- 1999 A meta-analysis of three decades of validating thoracic impedance cardiography Raaijmakers E, Faes T, Scholten, Rob J, Goovaerts H, Heethaar R. Critical Care Medicine. Volume 27 - Issue 6 - pp 1203-1213
- 2003 Impedance Cardiography Joseph M. Van De Water, Timothy W. Miller et al Chest vol. 123, 2028-2033