CPR-related Studies

Bystander CPR

Bystander Cardiopulmonary Resuscitation (CPR) in Out-of-Hospital Cardiac Arrest
Bossaert, L., Van Hoeyweghen, R. and the Cerebral Resuscitation Study Group
Circulation, 1989

Bystander CPR is related to significantly improved survival rate, especially in cases with a long time before advanced life support (ALS) treatment is administered. Bystander CPR does not affect long-term survival rates for patients that received ALS within the first 8 minutes; however, when the time of ALS exceeded 8 minutes, the long-term survival rate was significantly better when a bystander performed CPR.

Quality and Efficiency of Bystander CPR
Van Hoeyweghen, R. J.; Bossaert L. L; Mullie, A.; Calle, P.; Martens, P.; Buylaert, W. A., Delooz, H., Belgian Cerebral Resuscitation Study Group
Resuscitation, 1993

Bystander CPR is related to significantly improved survival rate and incorrect bystander CPR does not have a significant negative effect on survival rate in comparison with correct bystander CPR.

Quality of Bystander Cardiopulmonary Resuscitation Influences Outcome After Perhospital Cardiac Arrest
Wik, L, MD, PhD; Steen, P.A.; Bircher, N.G.
Resuscitation, 1994

Patients who undergo cardiac arrest and receive correct CPR from a bystander have a much higher discharge rate from the hospital.

Effectiveness of Bystander Cardiopulmonary Resuscitation and Survival Following Out-of-Hospital Cardiac Arrest
Gallagher, J.E.; Lombardi, G., MD; Gennis P., MD,
JAMA, 1995

Effective bystander CPR is associated with a significant improvement in survival rates following out-of-hospital cardiac arrest.

Efficacy of Bystander CPR: Intervention by Lay People and by Healthcare Professionals
Herlitz, J.; Svensson, L.; Holmberg, S.; Ängquist, K, Young, M.
Resuscitation, 2005

The chance of survival from out-of-hospital cardiac arrest (in a multivariate analysis) has a two-fold increase if a lay person performs bystander CPR; when bystander CPR is performed by healthcare professional, the survival rate is even higher.

Evaluating the Quality of Prehospital Cardiopulmonary Resuscitation by Reviewing Automated External Defibrillator Records and Survival for Out-of-Hospital Witnessed Arrests
Ko, P.C.; Chen, W.; Lin, C., MA, M.H., Lin, F.
Resuscitation, 2005

Patients who receive adequate CPR have a six times higher chance of survival and hospital discharge rate than patients who receive inadequate CPR.

CPR and Defibrillation

Influence of Cardiopulmonary Resuscitation Prior to Defibrillation in Patients With Out-of-Hospital Ventricular Fibrillation
Cobb, L.A., MD; Fahrenbruch, C.E., MSPH; Walsh, T.R., NREMT-P; Copass, M.K., MD; Olsufka, M., RN; Breskin, M., MS; Hallstrom, A.P., PhD
JAMA, 1999

The overall survival rate and hospital discharge for out-of-hospital cardiac arrest victims improves from 24 to 30 percent when 90 seconds of CPR is performed, compared to victims who do not receive CPR prior to a defibrillating shock.

Delaying Defibrillation to Give Basic Cardiopulmonary Resuscitation to Patient With Out-of-Hospital Ventricular Fibrillation – A Randomized Trail
Wik, L., MD, PhD; Hansen, T.B.; Fylling, F.; Steen, T., MD; Vaagenes, P., MD, PhD; Auestad, B.H., PhD; Steen, P.A., MD, PhD
JAMA, March 19, 2003

For EMT response times that exceed five minutes, the delivery of CPR before defibrillation significantly increases the rate of survival.

The Three-Phase Model of Cardiac Arrest as Applied to Ventricular Fibrillation in a Large, Urban Emergency Medical Services System
Vilke, G.M.; Chan, T.C.; Dunford, J.V.; Metz, M.; Ochs, G.; Smith, A.; Fisher, R.; Poste, J.C.; McCallum-Brown, L.; Davis, D.P.
Resuscitation, 2005

Patients who suffer cardiac arrest, wait for more than four minutes and receive CPR from a bystander prior to EMS arrival, there is an increased chance of successful resuscitation and long-term survival.

Quality of CPR

Effect of caregiver gender, age, and feedback prompts on chest compression rate and depth
Mary Ann Peberdy, Annemarie Silver and Joseph P. Ornato
Resuscitation, August 2009

The quality of chest compressions administered by U.S. hospital personnel is often suboptimal when performed on a manikin and can be improved with CPR feedback technologies.

Chest Compression Rates During Cardiopulmonary Resuscitation are Suboptimal – A Prospective Study During In-Hospital Cardiac Arrest
Abella, B.S., MD, MPhil; Sandbo, N., MD; Vassilatos, P., MS; Alvarado, J.P., BA; O'Hearn, N., RN, MSN; Wigder H.N., MD; Hoffman, P., CRT; Tynus, K., MD; Hoek, T.L.V., MD; Becker L.B., MD
Circulation, 2005

A 2005 study found that in-hospital chest compression rates are significantly below recommended international CPR guidelines, and that this suboptimal number of chest compressions per minute correlates to poor survival rates.

Quality of Cardiopulmonary Resuscitation During In-Hospital Cardiac Arrest
Abella, B.S., MD, MPhil; Alvarado, J.P., BA; Myklebust, H., BEng; Edelson, D.P., MD; Barry, A., RN, MBA; O'Hearn, N., RN, MSN; Hoek, T.L.V., MD; Becker, L.B., MD
JAMA, January 19, 2005

A *JAMA* study published in 2005 revealed very poor CPR quality in the in-hospital setting, referencing too few and shallow chest compressions and too many ventilations per minute.

Quality of Cardiopulmonary Resuscitation During Out-of-Hospital Cardiac Arrest
Wik, L., MD, PhD; Kramer-Johansen, J., MD; Myklebust, H., BEng,
JAMA, 2005

A 2005 *JAMA* study showed that during the administration of CPR, there were no chest compressions delivered nearly half of the time and that when delivered, just around one third adhered to recommended CPR guidelines.

An Automoated Voice Advisory Manikin System for Training in Basic Life Support Without an Instructor. A Novel Approach to CPR Training.
Wik, L.; Thowsen, J.; Steen, P.A.
Resuscitation, 2001

Feedback on CPR performance can (almost immediately) improve the basic CPR skills of paramedic students. In addition, using feedback devices help students attain a high level of performance and maintain that high level even when feedback is taken away.

Retention of Basic Life Support Skills Six Months After Training with an Automated Voice Advisory Manikin System Without Instructor Involvement
Wik, L.; Myklebust, H.; Auestad, B.H.
Resuscitation, 2002

The use of a computer-based Voice Advisory Manikin (VAM) feedback system can improve basic life support CPR skills immediately.

Improving CPR Performance Using an Audible Feedback System Suitable for Incorporation Into an Automated External Defibrillator
Handley, A. J. and Handley, S. A. J.
Resuscitation, 2003

In a study published in *Resuscitation* in 2003, feedback on CPR performance improved the quality of CPR delivered by trained nurses suggesting that if feedback were incorporated, it could lead to better CPR performance during a resuscitation attempt.

The Effect of a Voice Advisory Manikin (VAM) System on CPR Quality Among Prehospital Providers
Hostler, D., PhD, NREMT-P; Wang, W., MD, MPH; Parrish K., RN, EMT-P; Platt, T.E.; M.ED., NREMT-P, Guimond, G., BS, NREMT-P
Prehospital Emergency Care, 2005

A *Prehospital Emergency Care* study revealed that over a period of three-minute, one-rescuer CPR, verbal feedback prevents a decrease in chest compression and ventilation performance.

Better Adherence to the Guidelines During Cardiopulmonary Resuscitation Through the Provision of Audio-Prompts
Chiang, W.; Chen, W.; Chen, S.; Ko.,P.C.; Lin, C.; Tsai, M.; Chang, W.; Chen, S.; Tsan, C.;Ma, M.H.
Resuscitation, 2005

Feedback improves the adherence to CPR guidelines in the clinical setting and improves adherence to the guidelines on chest compression rates, intubation time, and hands-off periods.

Twelve-Month Retention of CPR Skills with Automatic Correcting Verbal Feedback
Wik, L.; Myklebust, H.; Auestad, B.H.,
Resuscitation, 2005

A computer-based voice advisory feedback system improves the basic life support CPR skills on a manikin with no worsening in feedback-supported performance after 12 months.