



Defibrillator

KIHT Technical Compendium

DEFIBRILLATOR

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Version 1.0

Acknowledgment:

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ACRONYMS/ABBREVIATIONS

SCA	Sudden Cardiac Arrest
SCD	Sudden Cardiac Death
AED	Automated External Defibrillator
ICD	Implantable Cardioverter Defibrillator
WCD	Wearable Cardioverter Defibrillator
SA	Sinoatrial Node
VF	Ventricular Fibrillation
VT	Ventricular Tachycardia
AV	Atrioventricular Node
ECG	Electrocardiogram
IHD	Ischemic heart disease
CPR	Cardiopulmonary Resuscitation
AHA	American Heart Association
DFT	Defibrillation Threshold
AC	Alternating Current
DC	Direct Current
SpO ₂	Peripheral Capillary Oxygen Saturation
ETCO ₂	End-tidal CO ₂
BTW	Biphasic Truncated Waveform
VTP	Ventricular Tachycardia Polymorphic
VTM	Ventricular Tachycardia Monomorphic
ATL	Atrial Flutter
AIVR	Accelerated Idioventricular Rhythm

EXECUTIVE SUMMARY

Sudden cardiac death (SCD) is most commonly defined as death from unexpected circulatory arrest occurring within an hour of the onset of symptoms or during sleep. In the majority of cases, SCD is triggered by an arrhythmic event, most frequently ventricular tachycardia, ventricular fibrillation, and asystole, although recently, pulseless electrical activity has been noted more frequently. In a recent study, it has been observed that the occurrence of cardiac arrest in the United States is more than 500,000 people annually, and more than 70% of the out-of-hospital are due to cardiac arrhythmia treatable with defibrillators. The occurrences in India is more than 700,000 SCD annually. The lag of adequate risk stratification measures has dissatisfied the significant advancements made by India in emergency care management.

The best effective approach for such conditions is defibrillation in the early stage of identification. A defined therapeutic dose of an electrical energy is administered by a device called defibrillator. Defibrillation is defined as an application of the predefined electrical current across the myocardium to cause synchronous depolarization of the cardiac muscle; this action resolves the arrhythmia and re-establishes the normal functioning of the heart¹.

The global defibrillators market is expected to reach USD 10.88 Billion by 2022 from USD 9.32 Billion in 2017, growing at a CAGR of 3.1% during the forecast period. The driving factors for the growth of defibrillators are; technological advancements in defibrillators, growing focus on providing public-access defibrillators, increasing burden of target diseases & awareness programs on defibrillators are driving the growth of this market.

This dossier aims to provide a basic understanding of the physiological conditions that require intervention with defibrillation systems as well as technical information on these systems to provide a foundation for future research and reading. In addition, this dossier also highlights the market figures and Export-Import (EXIM) information.

¹ Tavakoli Golpaygani A et al., A Study on Performance and Safety Tests of Defibrillator equipment, *J Biomed Phys Eng* 2017; 7(4)

ABOUT:

Andhra Pradesh MedTech Zone (AMTZ) is an enterprise under the Government of Andhra Pradesh, a 270 Acre zone dedicated for medical device manufacturing with 200-250 manufacturing units. AMTZ provides the one-stop solution for all the manufacturers by providing, common scientific testing facilities (EMI/EMC, Electrical Safety, Radiation, Biomaterials Testing, 3D printing facilities), commercial facilities such as expo halls and warehouse.

Kalam Institute of Health Technology (KIHT) in the premises of AMTZ facilitates focused research on critical components pertaining to medical devices, technology transfer of innovative technologies through e-auction, market innovation, and access. These end to end solutions help to reduce the cost of manufacturing up to 40% and make health care products more affordable and accessible.

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