

Dr. Benjamin S. Abella: cardiac arrest is the most dramatic disease in medicine!

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Editor's note

Often does cardiac arrest occur suddenly and without warning. It occurs when the heart's pumping action is disrupted due to an electrical malfunction in the heart. This restrains blood from flowing around the body, depriving the brain of oxygen and causing unconsciousness and breathlessness of the victim in minutes. In United States, sudden cardiac arrest claims over 300,000 lives every year (1). Over the past decades, much work has been done by scholars worldwide to improve cardiac arrest patients' chance of survival, followed by better post-arrest care that maintains their quality of life.

As the Attending Physician and Vice Chair of Research of the Department of Emergency Medicine at the University of Pennsylvania in Philadelphia, Dr. Benjamin S. Abella has been studying for years into the approaches to manage sudden cardiac arrest, including evaluating the performance of cardiopulmonary resuscitation (CPR) and resuscitation, testing new methods to teach CPR in the community, prognosticating post-arrest neurologic outcomes, improving the application of therapeutic hypothermia and so forth. This time, we are honored to interview Dr. Abella who will introduce us to his studies on post-arrest targeted temperature management and post-arrest oxygen delivery, the difficulties encountered during research and his advice to young researchers.

Expert introduction

Benjamin S. Abella, MD, MPhil, currently serves as the Attending Physician and Vice Chair of Research of the Department of Emergency Medicine, University of Pennsylvania, Philadelphia. He is also the Professor of Emergency Medicine, Director of the Center for Resuscitation Science, Associate Scholar of the Center for Clinical Epidemiology and Biostatistics, and Medical Director of Penn Acute Research Collaboration (PARC) at the same university (Figure 1).

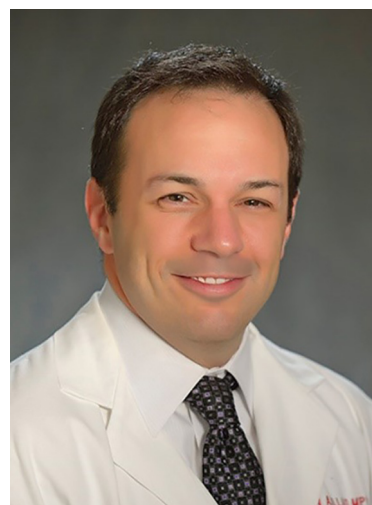


Figure 1 Dr. Benjamin S. Abella.

Dr. Abella studies broadly into sudden cardiac arrest and trains residents and medical students widely on the topics of cardiac arrest and post-arrest hypothermia treatment. He is actively involved in academic publishing in journals such as *JAMA* and *Circulation*, and in authoring review monographs and textbook chapters on cardiac arrest and resuscitation. His research receives continued funding supports from NIH, Medtronic Foundation and industry sources.

Interview

JTD: *Why are you particularly interested in the study of cardiac arrest?*

Dr. Abella: Cardiac arrest is the most dramatic disease in medicine: it's a life or death condition, and every minute matters... Survival is very time dependent. Therefore, it interests me as an emergency physician because it is dramatic, very important to so many people, and we can make a big difference in people's lives. I remember well a patient who had a prolonged arrest and was in a coma for

days following resuscitation. Her 9- and 12-year old kids met with me after her recovery and thanked me for bringing their mother back. That leaves a big impression!

JTD: *Targeted temperature management was established as a key post-arrest therapy, but you mentioned that its optimal prescription awaits further exploration (2). Why?*

Dr. Abella: There are many aspects of post-arrest targeted temperature management (TTM) that remain to be figured out. For example, some evidence suggests that a longer period of TTM (more than 24 hours) may improve survival but other evidence suggest no improvement with longer TTM. That issue remains controversial and needs more study. Another example is the use of TTM for in-hospital cardiac arrest, which has never been studied in any randomized trial. There are plenty of other examples—the field of post-arrest care is still young!

JTD: *What has your team been doing to optimize the prescription of TTM?*

Dr. Abella: We have worked hard to optimize TTM at our hospital, and what we have actually found is that it just requires old fashioned effort. That is, we make sure to track all cases of cardiac arrest and TTM use, and to make sure we are available to answer questions for providers and update our protocols with the best and newest science.

JTD: *What are the advantages and limitations of the use of TTM in managing out-of-hospital cardiac arrest? Are there any alternatives?*

Dr. Abella: TTM is one of the few therapies that improves survival and neurologic recovery. One limitation is that many patients still suffer neurologic injury or death despite TTM, so the therapy is only part of the solution. Alas, we don't have good alternatives—another reason why additional research on this topic is so important.

JTD: *Can you introduce us to your most recent funded research, including its scope, purpose, duration of funding and current status?*

Dr. Abella: Our team has recently been funded by National Institutes of Health (NIH) to study post-arrest oxygen delivery and its role in cardiac arrest outcomes. This is

a 5-year multicenter study in which we found that too much oxygen following cardiac arrest may indeed worsen outcomes from cardiac arrest, because much of post-arrest injury has to do with oxygen biology, mitochondrial dysfunction and oxygen free radical generation. In this sense, oxygen may be the “fuel” that worsens post-arrest injury. This study has recently been published in *Circulation* (a scientific journal published by Lippincott Williams & Wilkins for the American Heart Association); more work is ongoing from our team in this area.

JTD: *What are the most common challenges in research? And what would be your advice to young researchers?*

Dr. Abella: Research is exhilarating and meaningful, but very challenging. Organizing studies and getting them funded takes enormous effort and loads of previous experience—it's very hard to launch a study without much support from experienced and research trained individuals. For those who are new to clinical research, the most important advice I can give is that finding experienced and wise mentors and collaborators can make all of the difference. And to be a successful researcher, two attributes are crucial: having a love for asking questions, and having persistence. It's a difficult career with many challenges, so persistence is crucial—one must never give up when faced with roadblocks.

JTD: *As a professor, physician, researcher and director, how do you strike a balance among all the duties and relieve stress?*

Dr. Abella: Striking a balance is very difficult! My wife is also a physician and we have three children—so our lives are very busy. I work very hard and enjoy my work, so that helps. Indeed, I value time with my family very much; one key way I manage this is to take wonderful vacations with them, where I (mostly) put my work and telephone away for a week several times a year. Traveling is also a terrific way to manage stress and pressure, clearing the mind and allowing one to think more clearly.

Acknowledgements

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Footnote

Conflicts of Interest: The author has no conflicts of interest to declare.

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