

# The Top 100 Cited Scientific Reports Focused on Congenital Heart Disease Research

JG Weinberg, MD, KM Burns, MD, GD Pearson, MD, ScD, and JR Kaltman, MD  
National Heart, Lung, and Blood Institute, National Institutes of Health, Bethesda, MD



## Disclosures: None

### Background

- Congenital heart disease (CHD) is one of the most common birth defects
  - Estimated incidence of moderate and severe forms of CHD of 6/1,000 live births
- Significant improvements have been made in the treatment and care for patients with CHD over the past 100 years
- Improved survival to adulthood of >90% overall
- Research advances have been especially dramatic in understanding genetic and environmental causes for CHD

### Objectives

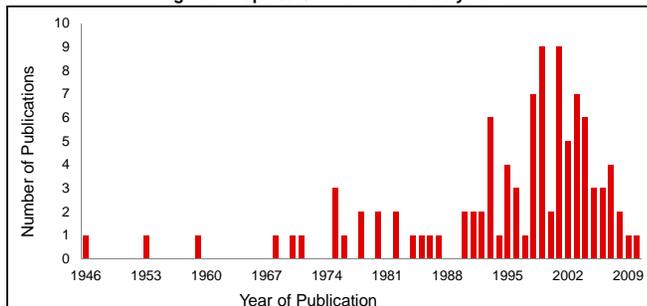
- Identify the 100 most frequently cited articles that describe advances in structural CHD research
- Describe the content and funding sources

### Methods

- Searched the Science Citation Index-expanded (1900-2014) database provided by the Institute for Scientific Information Web of Science (<http://thomsonreuters.com/web-of-science/>) for search term "congenital heart"
- Determined the 100 most frequently cited articles in structural CHD research
- Inclusion criteria:
  - Primary intent to study structural CHD
  - Original research and guidelines
- Exclusion criterion:
  - Other article types (case reports, review articles, letters)
- Analyzed the selected top 100 articles for:
  - Citation number
  - Authorship details, including country of origin
  - Publication source
  - Funding source
  - Type of article and study design
- Statistical analysis:
  - Descriptive statistics

## Results

**Figure 1: Top 100 CHD Publications By Year**



**Table 1: Type of Article for Top 100 CHD Publications (%)**

Type of Article	Count
Observational clinical research	46
Basic science research	22
Clinical trial	19
Guideline	7
Translational research	6

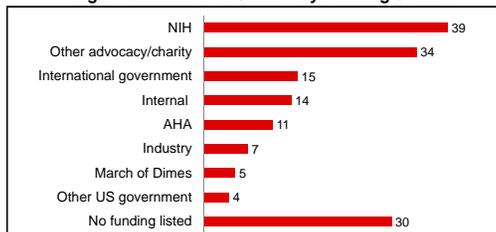
**Table 3: Country of Origin for First Author (%)**

Country	Count
United States	65
United Kingdom	11
Japan	6
Canada	5
Italy	3

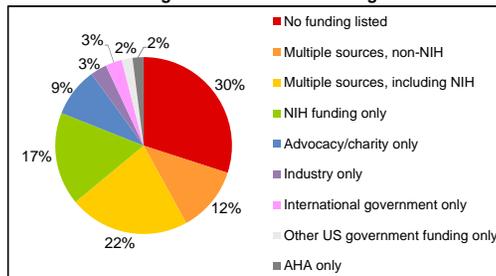
**Table 2: Topic of Article for Top 100 CHD Publications (%)**

Topic	Count
Cardiac development and/or genetics	32
Cardiac surgical and postoperative topics	17
Other	12
Adult congenital heart disease topics	11
Epidemiology of CHD	10
Fetal cardiology	6
Cardiac imaging	6
Interventional topics	5
Electrophysiology in CHD	1

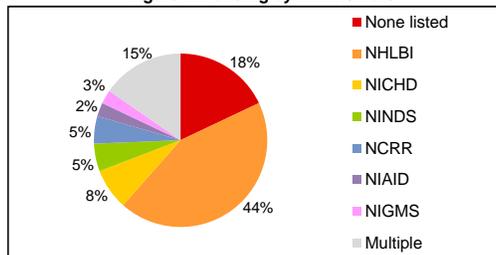
**Figure 2: NUMBER of Studies by Funding Source**



**Figure 3: Sources of Funding**



**Figure 4: Funding by NIH Institute**



- The 100 most highly cited publications had a total of 24,711 citations, with a range from 159 to 1,000 citations per article, and an average of 247 citations per article
- The average number of citations per year since publication was 16.1 (range 2.8 – 77.0)
- Funding sources were identified in 70% of studies

**Table 4: Most Frequent Publishing Journals (number of studies)**

Journal	Number of Studies
Circulation	33
Development	6
Journal of the American College of Cardiology	6
Journal of Thoracic and Cardiovascular Surgery	5
Nature	5
Pediatrics	4
Cell	4
European Heart Journal	3
American Journal of Cardiology	3
Heart	3

### Limitations

- The determination of study topic to be primarily structural CHD topics was subjective
- There are likely studies missed with our current search term; unlikely to be exhaustive search of the literature

### Conclusions

- The top 100 publications identified demonstrate a wide range of topics and research formats
- The National Institutes of Health represents a major funding source of these highly cited CHD publications