

Circulatory Diseases in the US | Overview

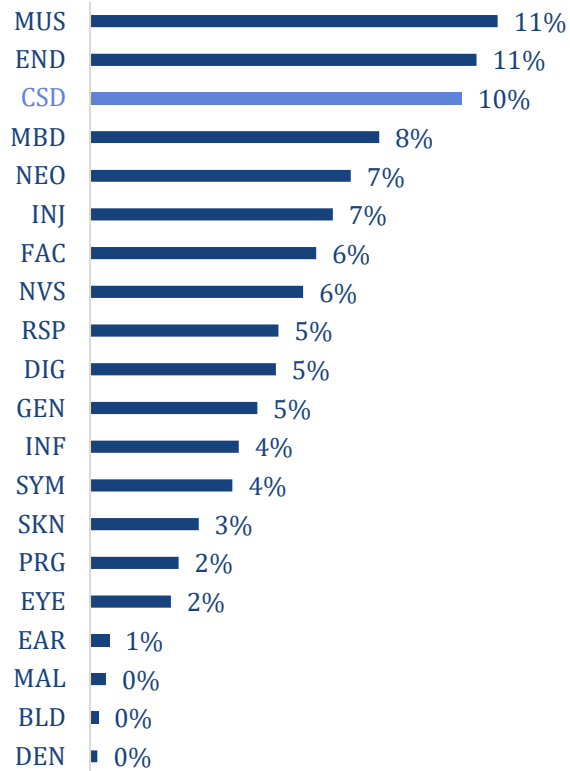
Haoting Huang, Jessica Liu, Rachel Diaz

Summary

Circulatory diseases represented 10.4% of total medical expenditures in the 2021 fiscal year, with hypertension and cardiovascular disease being the most costly. While the number of patients with circulatory diseases has decreased since 2018, per-event expenses have risen. Hypertension remains the most common medical condition, while cardiac dysrhythmia remains the only circulatory condition showing an upward trend since 2019.

Nationwide medical expenses for circulatory system diseases (CSD) totaled \$226.2 billion in 2021, accounting for 10.4% of overall U.S. healthcare expenditures.

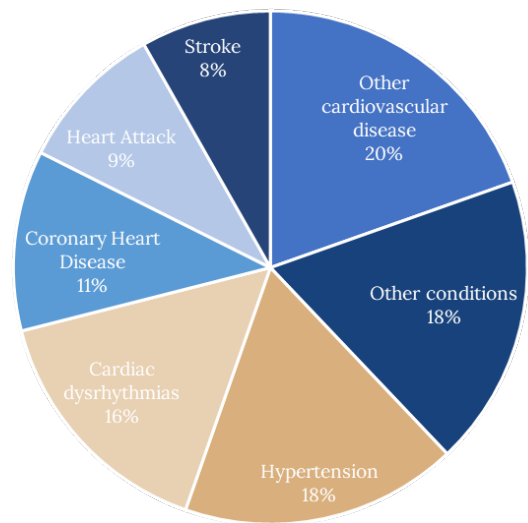
Disease Type as a % of Total Expenditure



Definitions

MUS: Diseases of the musculoskeletal system
 END: Endocrine, nutritional and metabolic diseases
 CSD: Circulatory System Diseases
 MBD: Mental, behavioral and neurodevelopmental disorders
 NEO: Neoplasms
 INJ: Injury and poisoning

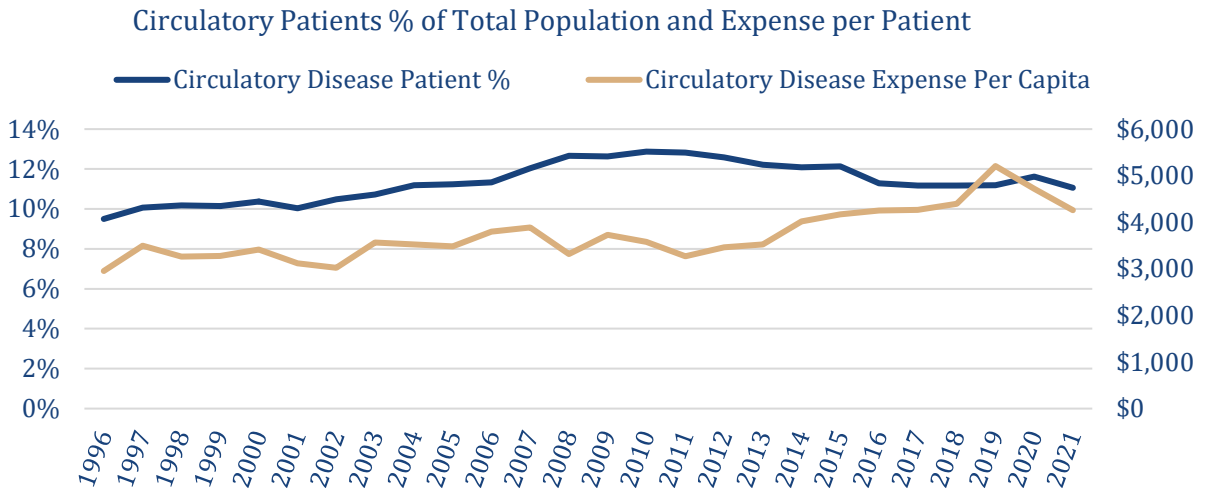
Among all CSDs, Hypertension and dysrhythmias have the highest expenditures.



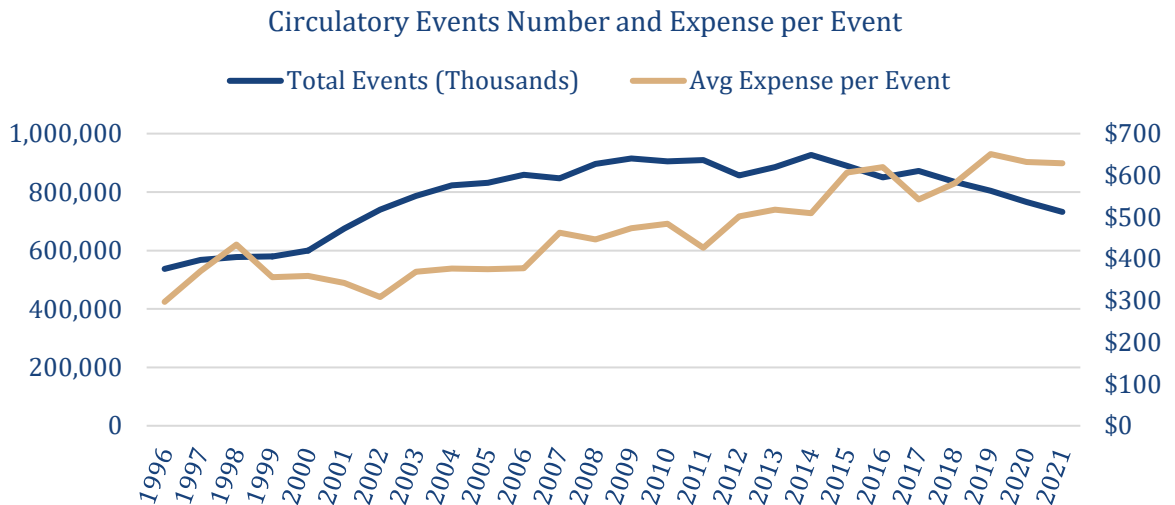
Source: Agency for Healthcare Research and Quality



Patients with CSDs represent 11% of the total U.S. patient population, but that figure is steadily decreasing. Since 2018, both the number of circulatory disease patients and the circulatory disease expense per patient have declined, on average.



As the number of CSD cases began trending downward in 2017, the average expense per event has continued to trend upward.

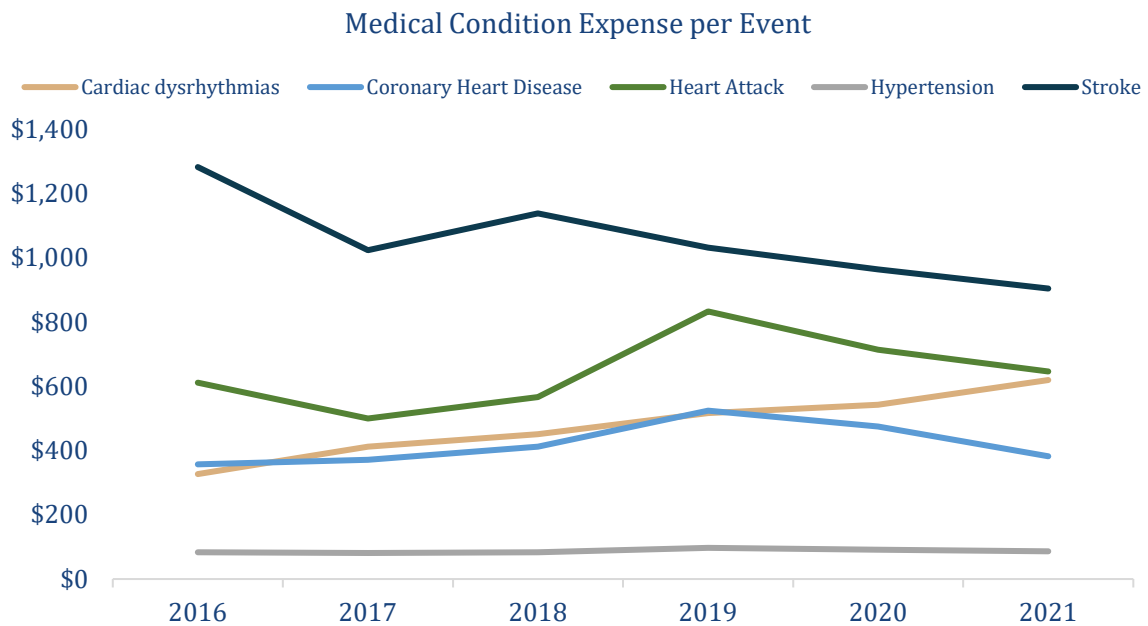
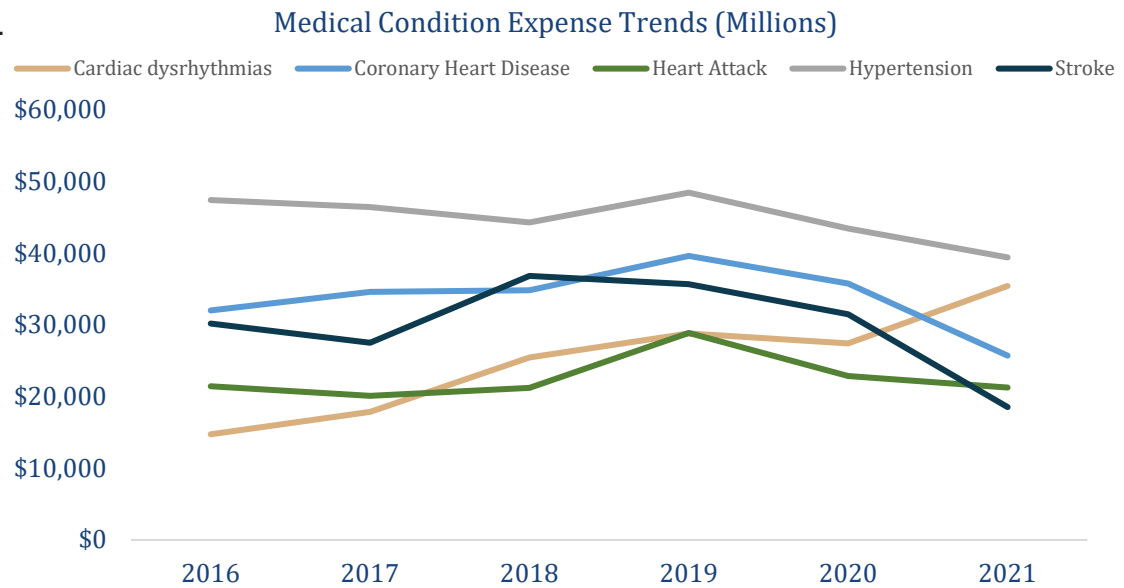


Source: Agency for Healthcare Research and Quality



Cardiac Dysrhythmia is the only circulatory system disease showing an upward trend in both overall healthcare expenditure and expense per event since 2019. All other CSDs show a downward trend for both measures within the same time period.

The overall decline in healthcare expenses for CSDs aligns with the decreasing cost per event for most CSDs since 2019.

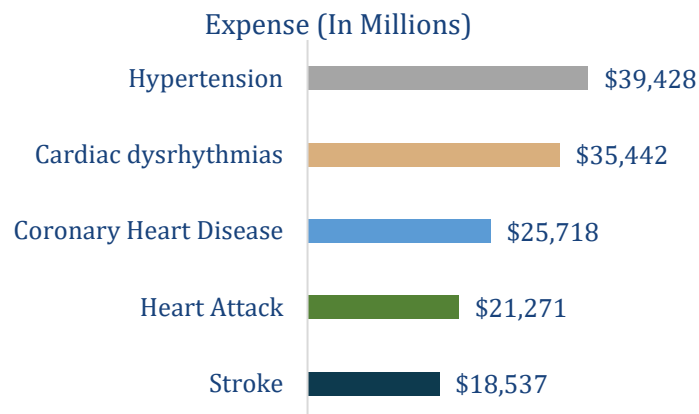
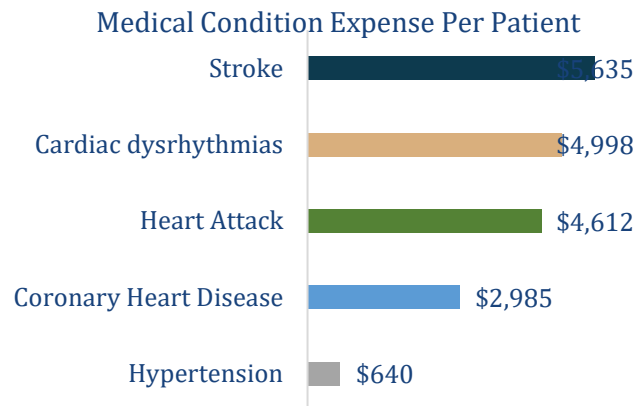
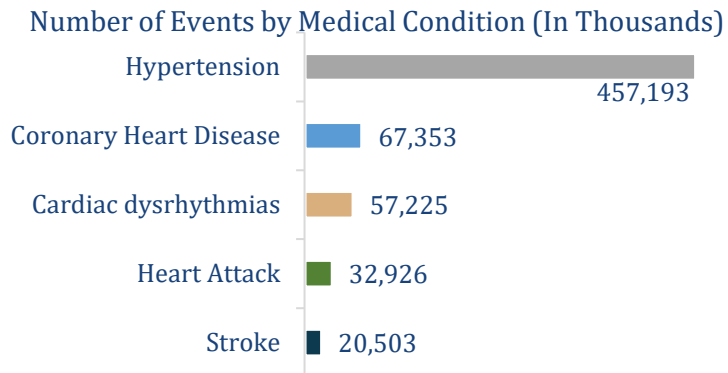


Source: Agency for Healthcare Research and Quality



Hypertension is the most common and costly CSD overall, though it has the lowest expense per patient.

Stroke is the least common and least expensive CSD overall, but it has the highest expense per patient.



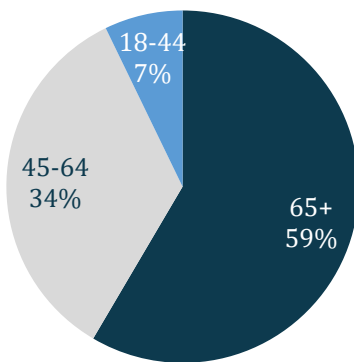
Source: Agency for Healthcare Research and Quality

AGE

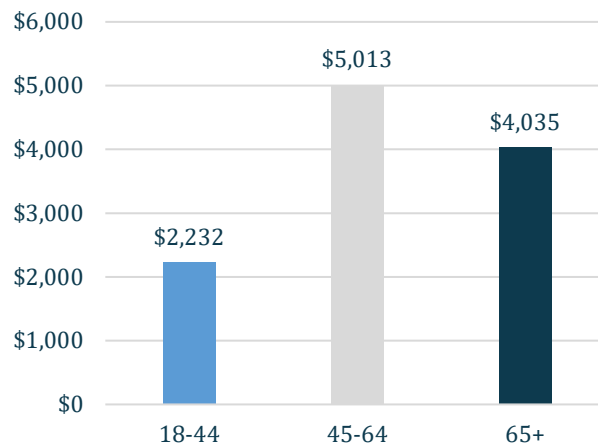
Patient Characteristics - Age

- Most CSD patients are 65+
- Cardiac Dysrhythmia is the most common CSD for patients 65+
- CSD expense per patient is highest for patients between ages 45-64

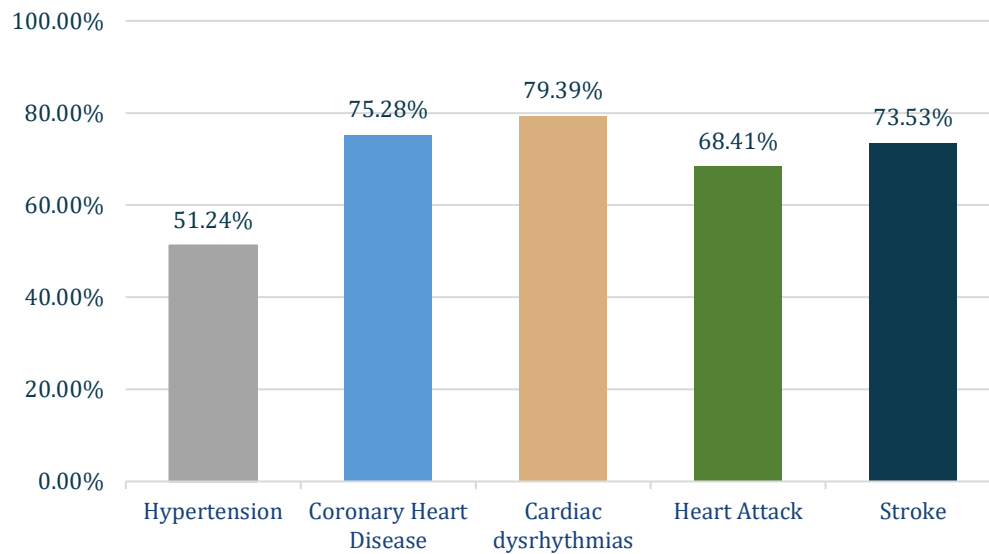
CSD Patients by Age



CSD Expense Per Patient by Age Group



Common CSDs Among Patients Who Are 65+



Source: Agency for Healthcare Research and Quality

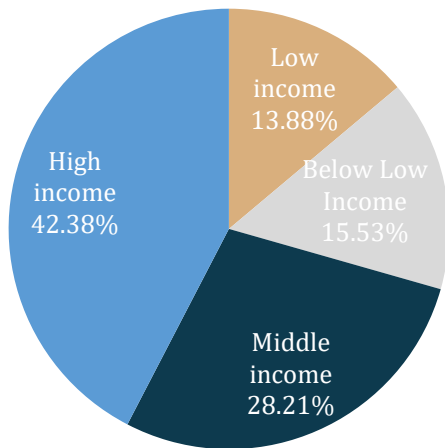


Individuals with higher income are more likely to experience circulatory conditions, while those with middle income incur the highest CSD expense per patient.

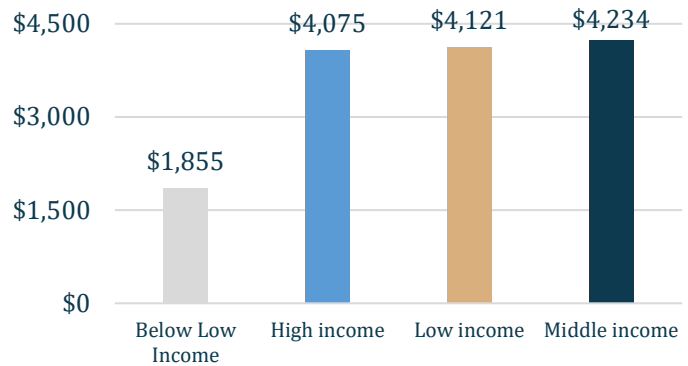
Among high-income patients, hypertension is the most common CSD.

INCOME

CSD Patient by Income Level



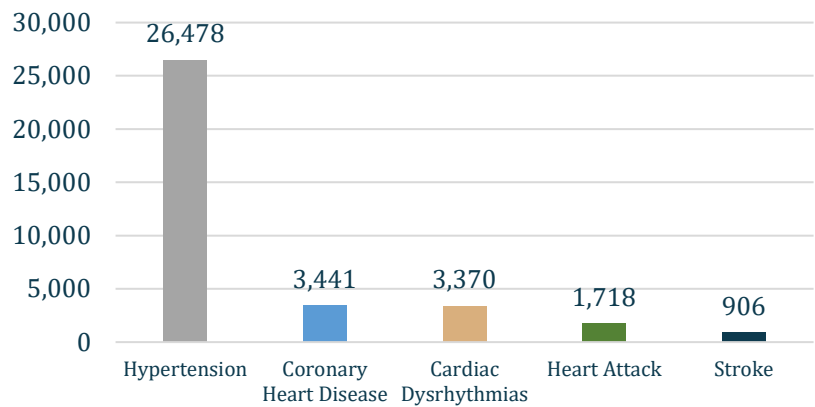
CSD Expense per Patient by Income Level



Household Income Level

Below Low Income:	< \$30,000
Low Income:	\$30,001 - \$58,020
Middle Income:	\$58,020 - \$94,000
High Income:	> \$94,001

High Income Patients by CSD (Thousands)



Source: Agency for Healthcare Research and Quality

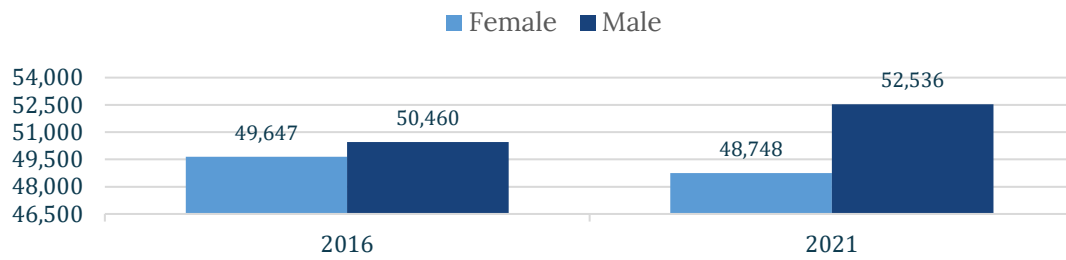


GENDER

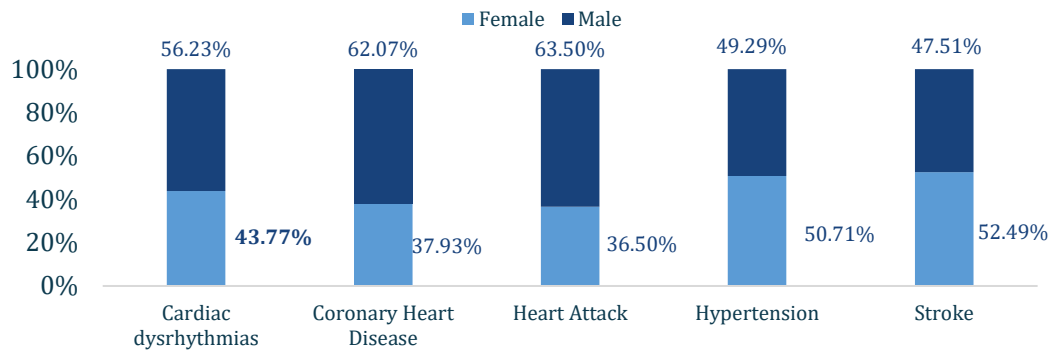
There have been more male patients with CSDs than female patients with CSDs from 2016-2021.

Hypertension and stroke are the most common CSDs among both genders, though heart attacks are more common and frequent for male patients.

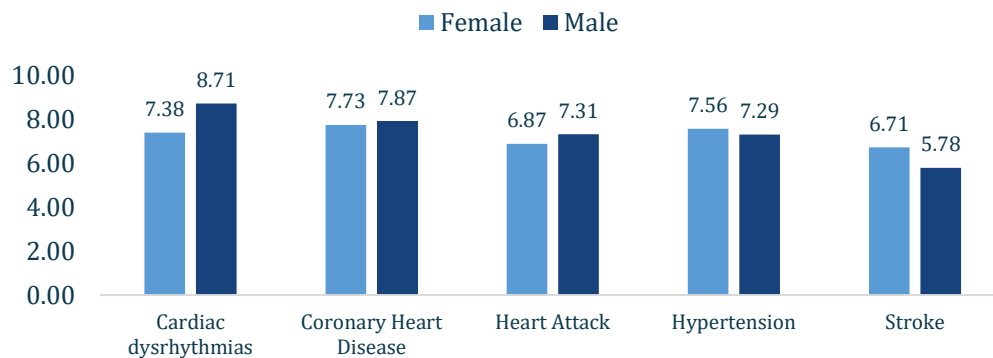
Number of CSD Patients by Gender (Thousands)



Proportion of CSD Events Nationwide by Gender (2021)



Average Number of CSD Event Per CSD Patient



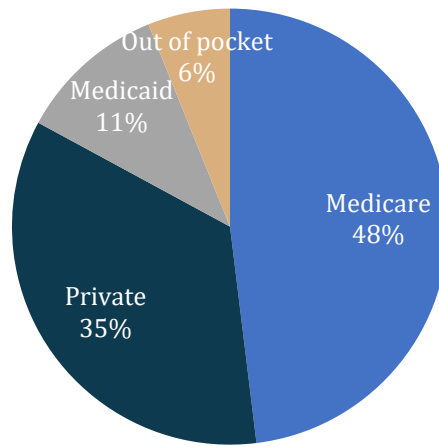
Source: Agency for Healthcare Research and Quality

PAYOR

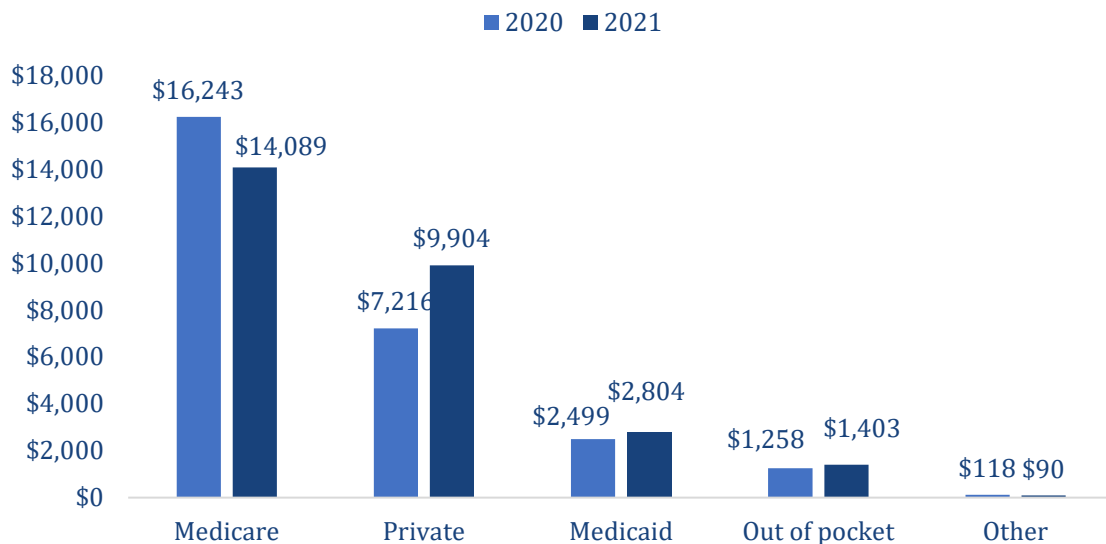
Medicare pays for nearly half of all CSD-related health expenses in the U.S.

While Medicare was the largest payor of CSD healthcare costs in both 2020 and 2021, the portion of CSD costs covered by private insurers is growing.

Total U.S. Expenditure on Circulatory System Diseases by Payor (2021)



CSD Expense Per Patient (2020 vs. 2021)



Source: Agency for Healthcare Research and Quality

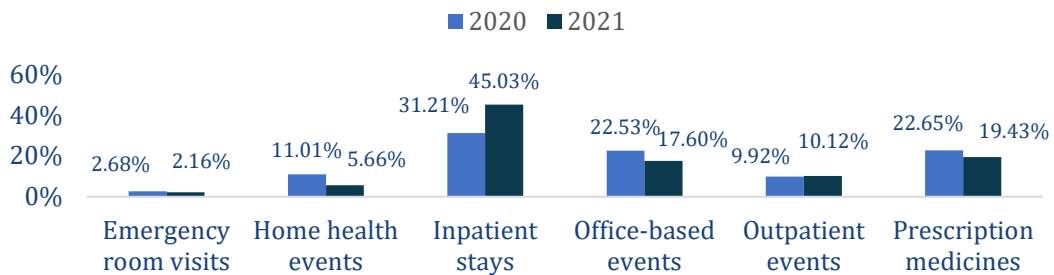


SETTINGS

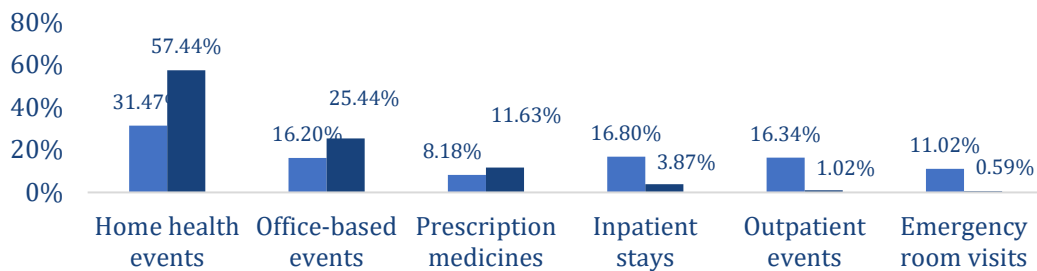
In 2021, inpatient stays were CSD patients' least common event type.

In 2021, home health was the most common event type among CSD patients. Only 3.87% of CSD events were inpatient stays, but this event type represented 45.03% of total CSD medical expenses. While 57.44% of CSD events were home health events, they represented only 5.66% of total CSD medical expenses. Inpatient stays were the most expensive event among CSDs and saw the most significant increase in cost per event out of all CSD event types from 2020 to 2021.

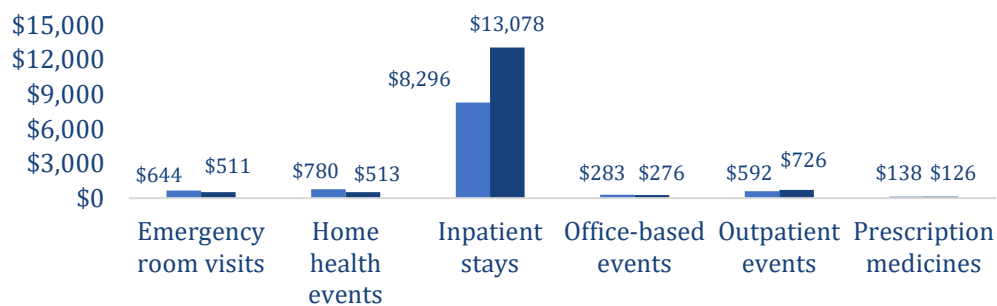
% of Total CSD Expense by Event Type (for 2020 & 2021)



% of Total CSD Events by Event Type



Average CSD Expense per Event by Event Type

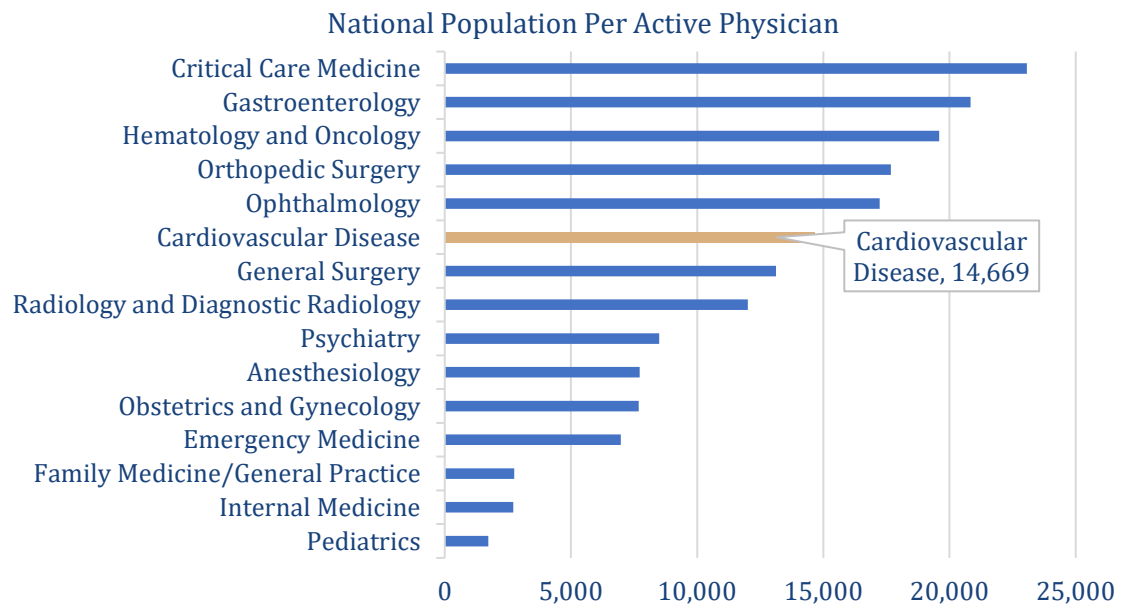
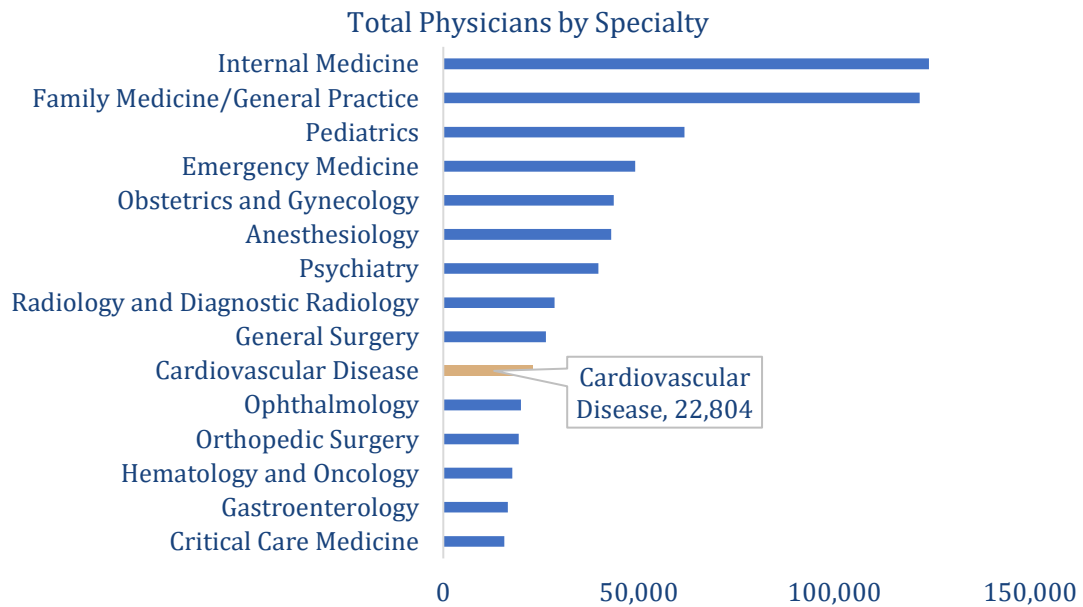


Source: Agency for Healthcare Research and Quality



SUPPLY

In 2022, cardiovascular specialists ranked among the top 10 medical specialties with the highest number of active physicians in the United States and had a sizable patient load per physician. The high number of active patients per cardiovascular specialist suggests a potential shortage of circulatory physician supply in the future.



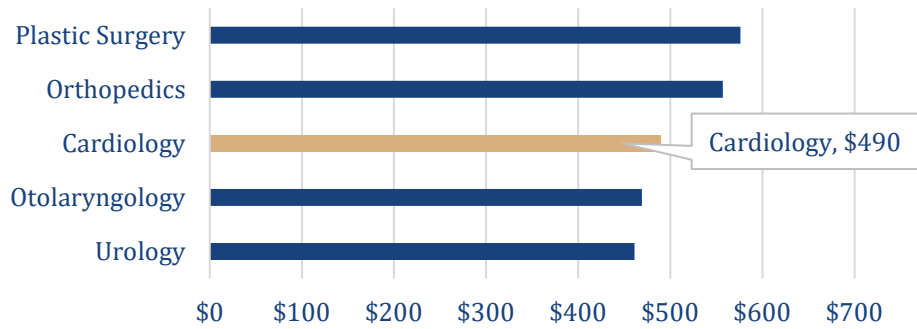
Source: Agency for Healthcare Research and Quality



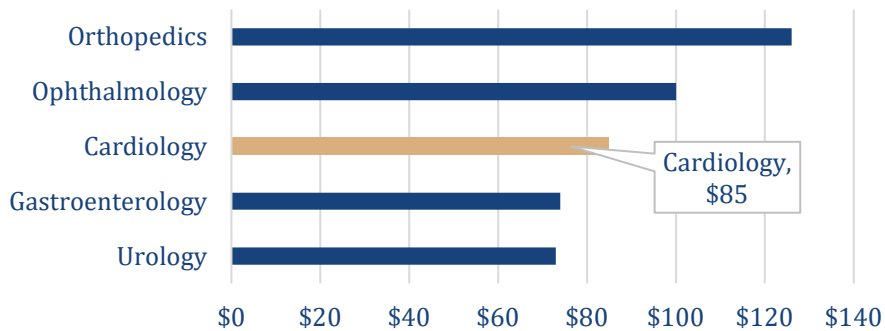
REVENUE

Cardiology is among the top three highest-paid physician specialties, receiving substantial annual incentive bonuses, and is one of the highest revenue-generating specialties for hospitals.

Annual Earnings by Specialist (Thousands)



Annual Bonus by Specialist (Thousands)



Annual Hospital Revenue Generated by Specialist (Thousands)



Source: Agency for Healthcare Research and Quality

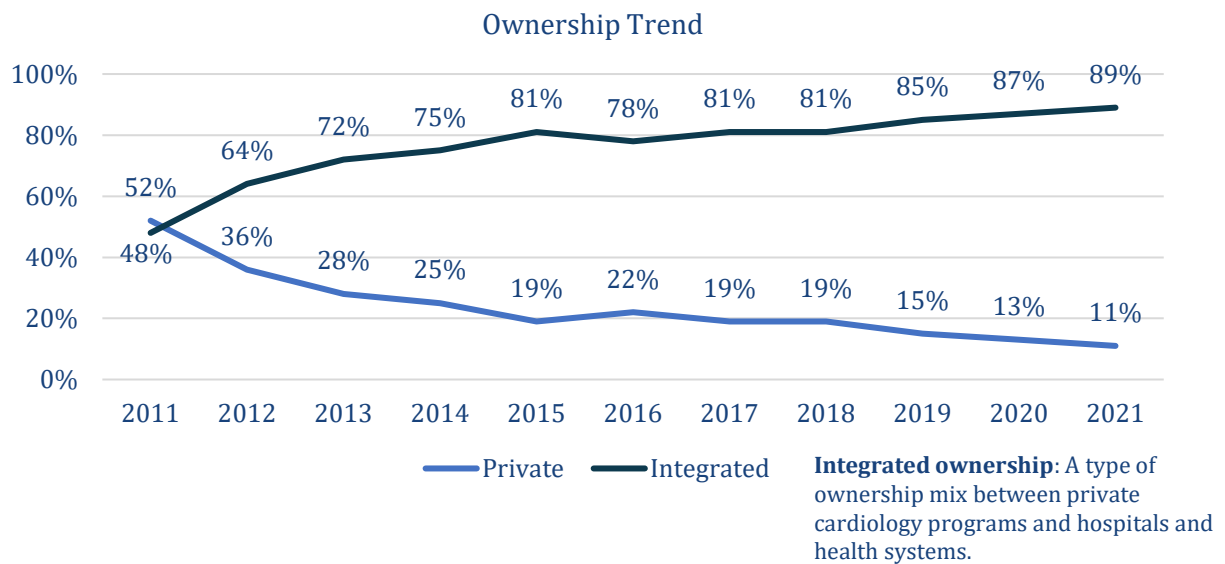
FUTURE

Future trends in cardiology:

- Targeting inflammation: Pharmaceutical and drug development address inflammation.
- Cardiac cell therapy: Development and research on damaged hearts repair using cardiac cell therapy.
- Transplanting pig hearts.
- Improvement of ventricular assist device.

Future change in the cardiology ownership model:

- There has been a shift from an equal ownership split between private cardiology practices and those integrated with hospitals or health systems to a slight majority (52%) favoring private practices. Since then, the ownership gap has widened, with 2022 survey data reporting that nearly nine out of ten programs (89%) are now in the integrated model.



Source: American College of Cardiology/Workforce in Crisis: Charting the Path Forward

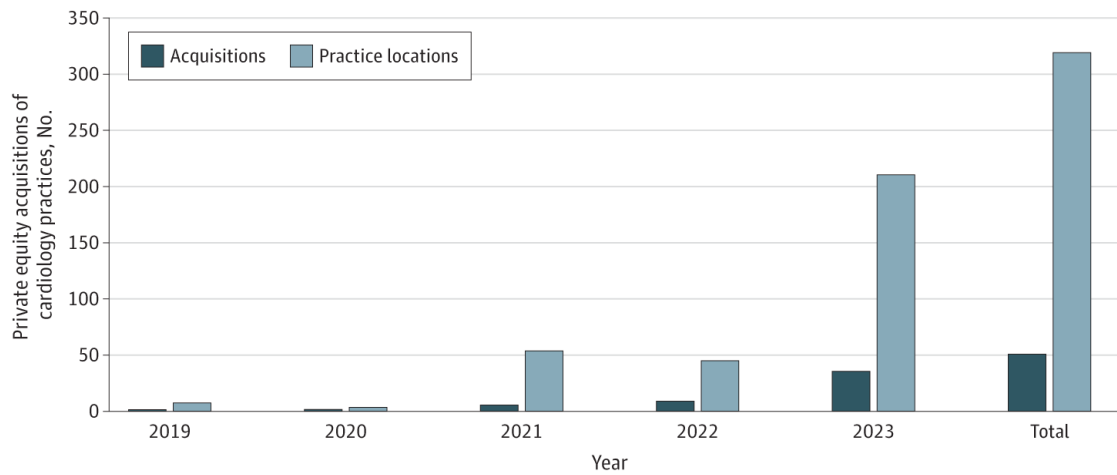
Source: Cardiac Interventions Today/A Decade in Review: Cardiology and Interventional Cardiology Trends

Source: Harvard Health Publishing/5 trends in cardiology to watch

PE Trends

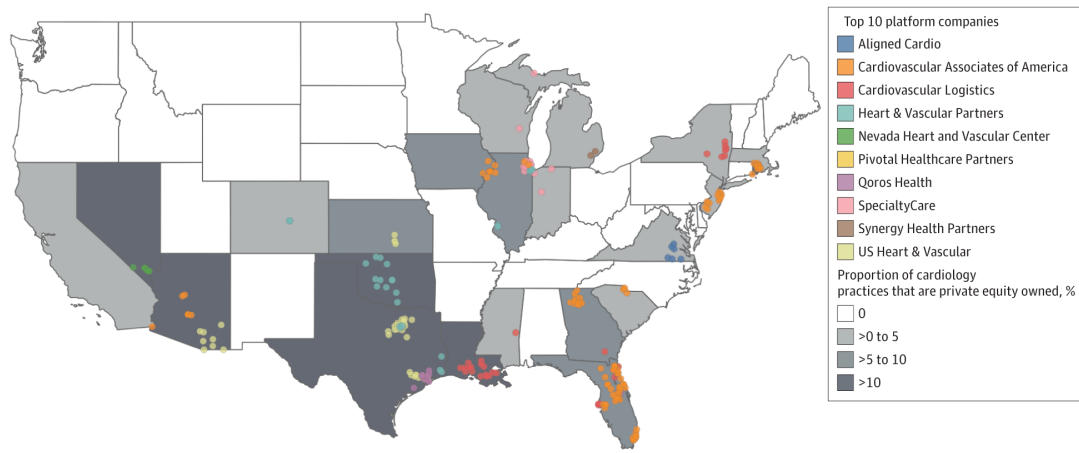
Private equity acquisitions of cardiology practices increased from 1 acquisition with 7 locations in 2019 to 50 acquisitions with 320 locations as of 2023.

The continued effort and add-on consolidation by PE funds in cardiology practices may lead to higher prices with implications for quality and access in the future.



Florida, Texas, and Arizona are the top 3 states with the most PE-acquired cardiology platforms.

Cardiovascular Associates of America and US Heart & Vascular are the largest PE-acquired platforms.



Source: Trends in Private Equity Consolidation in Cardiovascular Care by Yashaswini Singh, PhD, MPA1; Megha Reddy, MSPH1; Christopher Whaley, PhD

Source: Monetizing Medicine: Private Equity and Competition in Physician Practice Markets by Richard m. Scheffler, Laura Alexander, Brent d. Fulton, Daniel r. Arnold & Ola a. Abdelhadi