Implantable Cardioverter-Defibrillators in VHA and Healthcare Cost Growth: 2001-2010

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Conflicts of Interest

- No relationships to disclose

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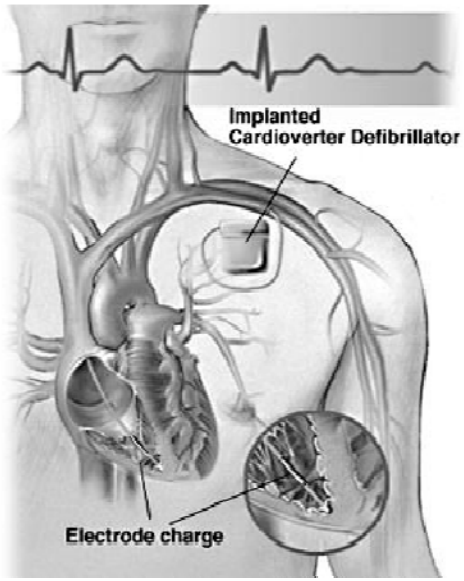
Background/1

- Implantable cardioverter-defibrillators (ICDs):
  - Class IA guideline-recommended therapy since 2005 for patients with chronic heart failure (CHF) and reduced left ventricular ejection fraction



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Background/2

- Chronic heart failure (CHF) is common among veterans over age 65
- Large numbers of veterans are likely ICD-eligible
- Unknown how many VHA-enrolled veterans with CHF have received ICDs during the past decade

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Background/3

- ICDs are costly to implant (>$30,000 in device cost alone) and to monitor
- Unclear how ICDs have impacted VA's health care costs
- Likewise uncertain how ICDs implanted outside VA among veterans enrolled in VHA ultimately impacted VA's costs of care

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Study Objectives/1

- To identify the total number of dual-enrolled (i.e., Medicare and VHA) veterans who received ICDs during 2001-2010
- To quantify the fraction of veterans with ICDs who received devices at VA (vs. outside)
- To determine the number of veterans living with an ICD who receive ongoing device care at VA

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Study Objectives/2

- To determine costs of VA health care attributable to ICD implantation and ongoing device care
- To measure the rate of VA ICD implantation among historically disadvantaged groups of veterans

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Data

- VA national administrative data from 2001-2010 (Medical SAS datasets)
- VA Fee Basis data
- VIReC VA-Medicare merged data (inpatient/outpatient facility claims and physician claims)

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Identifying implantation and continuity care in VA data

- Implantation identified by relevant *ICD-9* or *CPT* codes in the VA's hospitalization, surgery, procedure, or fee-basis administrative datasets
- ICD continuity care identified by
  - 1 relevant *ICD-9* or *CPT* code on an outpatient administrative record after a confirmed implant, or
  - 2 distinct outpatient entries with relevant codes for patients with no prior documented implant

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Identifying implantation and continuity care in Medicare data

- ICD implantation identified by the relevant *ICD-9* or *CPT* codes in Medicare hospitalization or outpatient facility claims
- ICD continuity care identified by:
  - 1 relevant *ICD-9* or *CPT* code on an outpatient claim subsequent to a confirmed implantation, or
  - 2 distinct outpatient claim with relevant codes for patients with no prior documented implant

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Cost attribution

- Costs of VA health care were estimated using HERC's Average Cost Datasets using 1-to-1 matches between Medical SAS and ACD records, added to Fee-Basis paid costs
- ICD implantation costs included the hospital costs of implant plus any other ICD-related encounters within 30 days of implant
- ICD continuity costs included all ICD-related costs outside of the implant window

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Identifying Race and SES

- Veterans' race determined from Medicare enrollment data
- Veterans' socioeconomic status (SES) approximated by median income (2000 U.S. Census) from veterans' residential ZIP code
- Veterans living in ZIP codes from the lowest 25th percentile median income (population-weighted) were identified as low-SES

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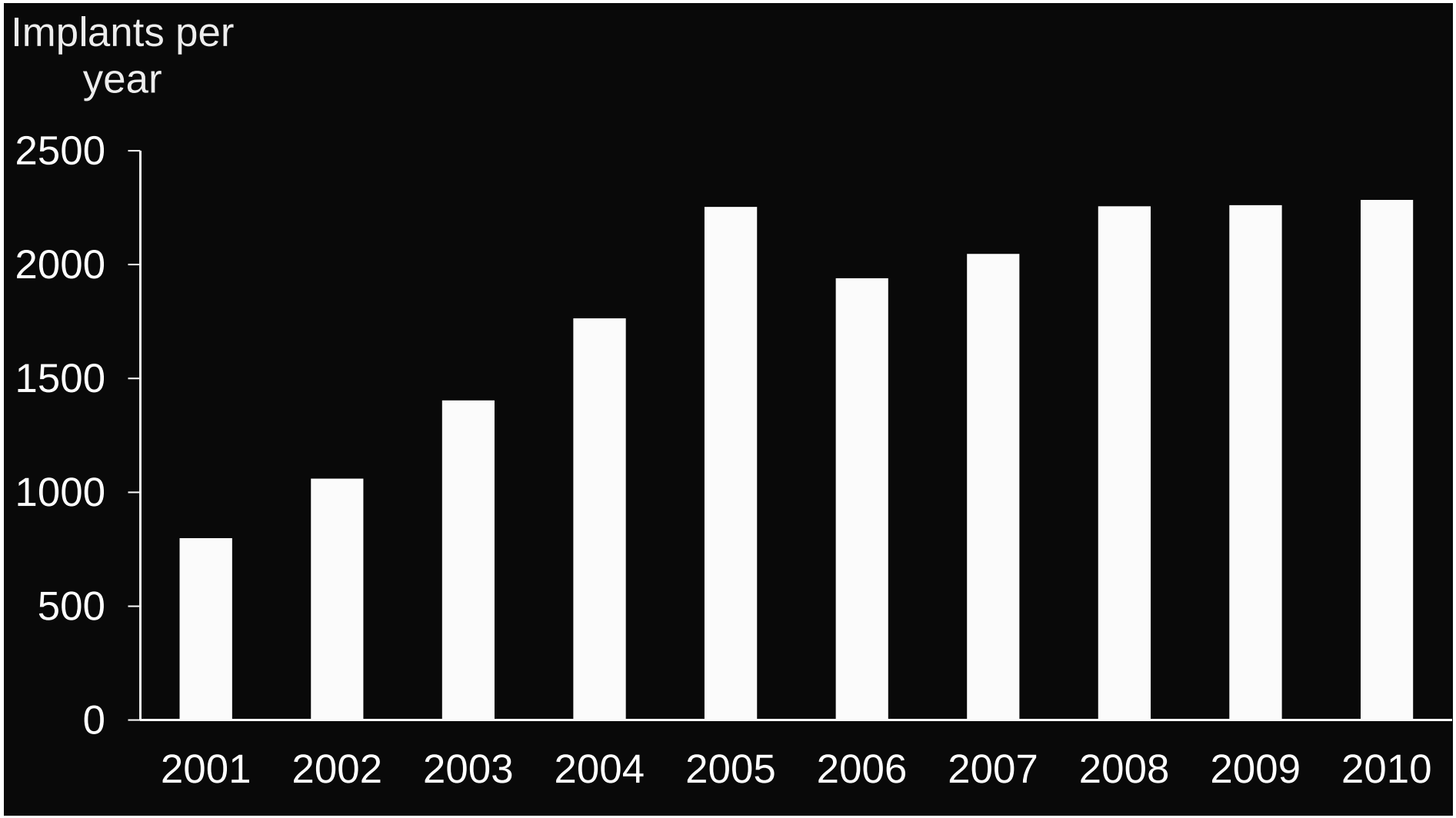
ICD Implants in the VHA, 2001-2010



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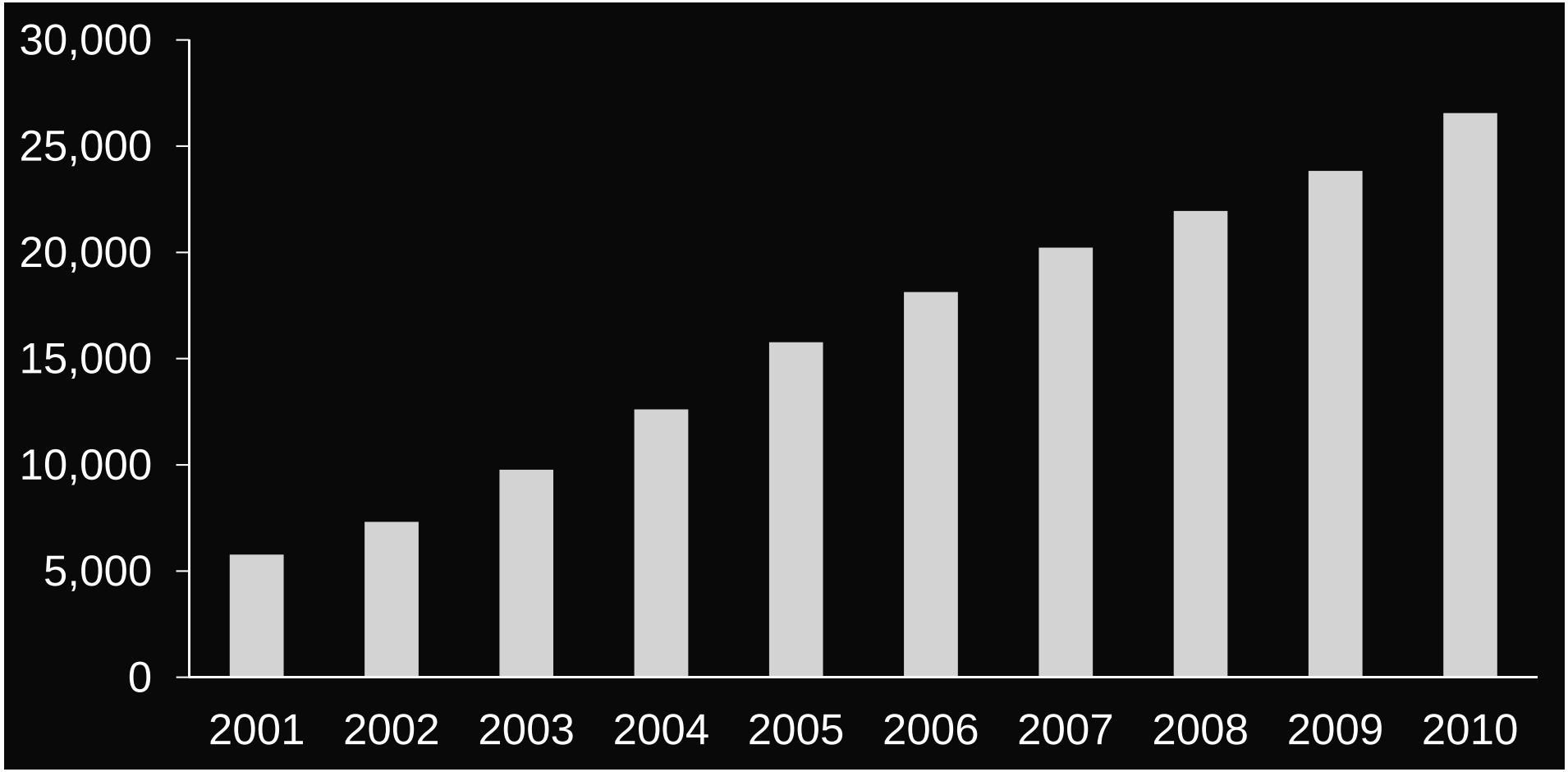
Total Veterans Receiving ICD-related VA Healthcare, 2001-2010



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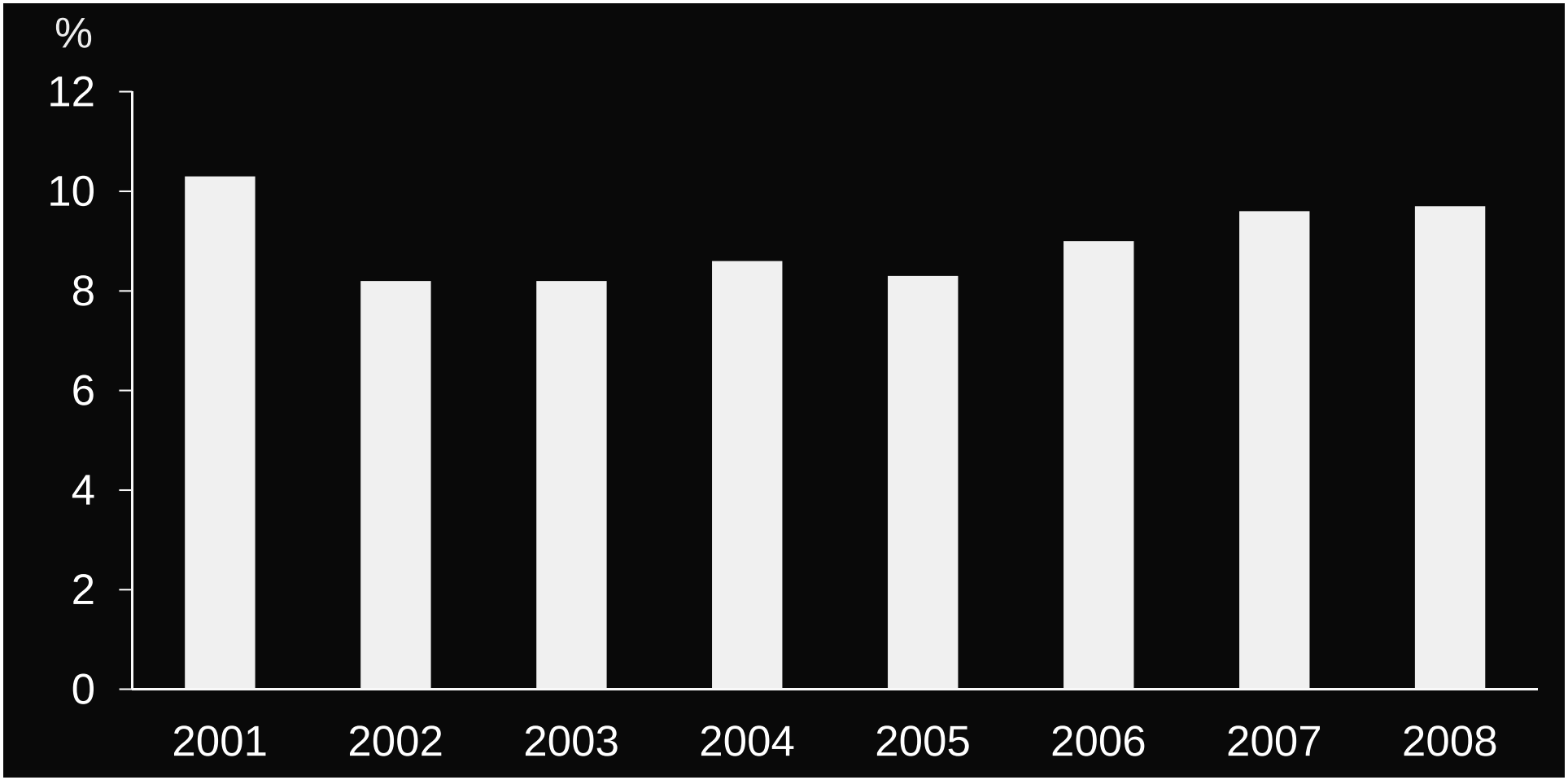
% of ICD Implants Among Dual-Eligible Veterans Occurring in VA



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Origin of Veterans' ICDs

Among veterans receiving regular ICD continuity care in VA from 2006-2008:

- 26% originally received ICD in VA
- 34% received ICD outside VA covered by Medicare
- 40% had no prior ICD implantation record in either VA or Medicare data

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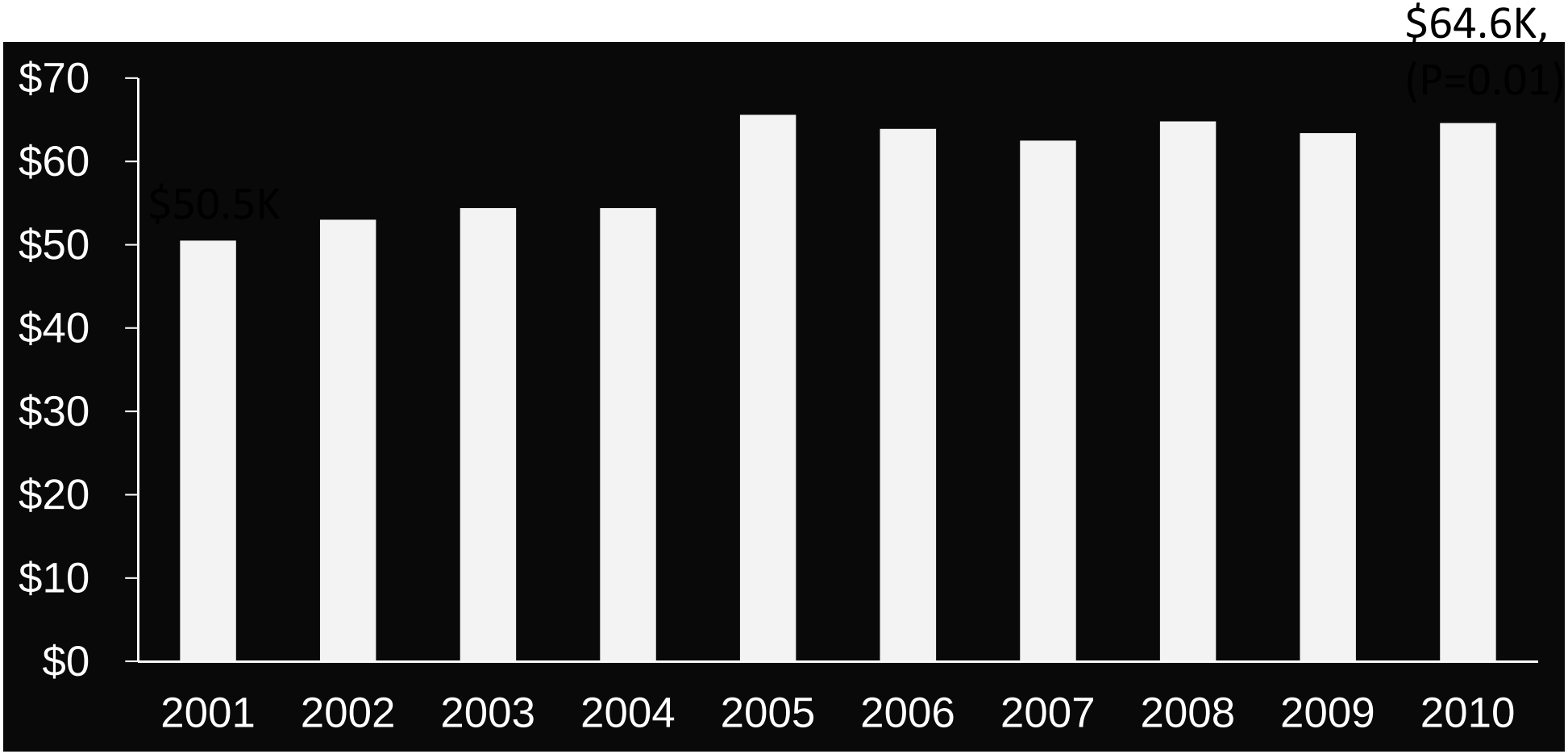
Per-patient ICD Implantation Cost (2010 $thousands), 2001-2010



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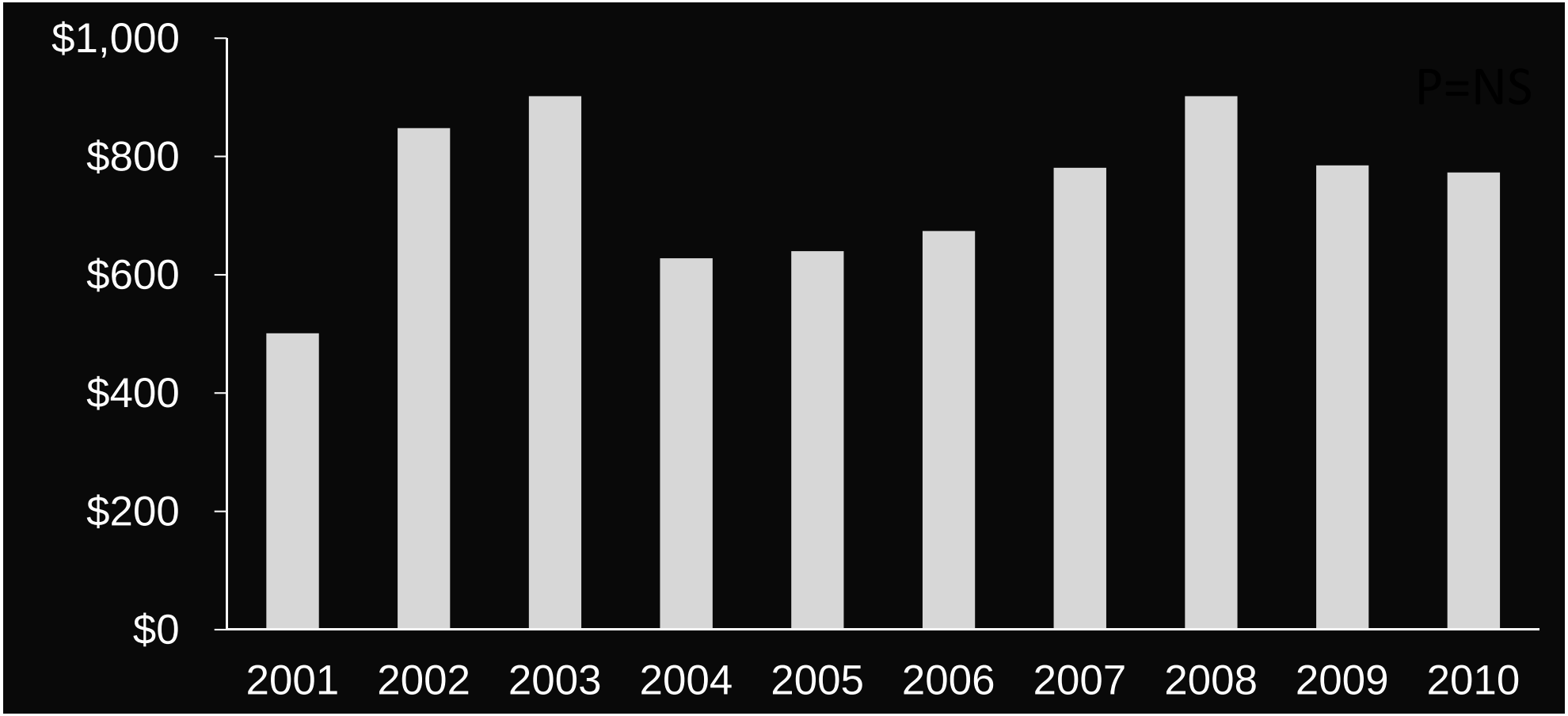
Per-patient ICD Continuity Care Cost (2010 $), 2001-2010



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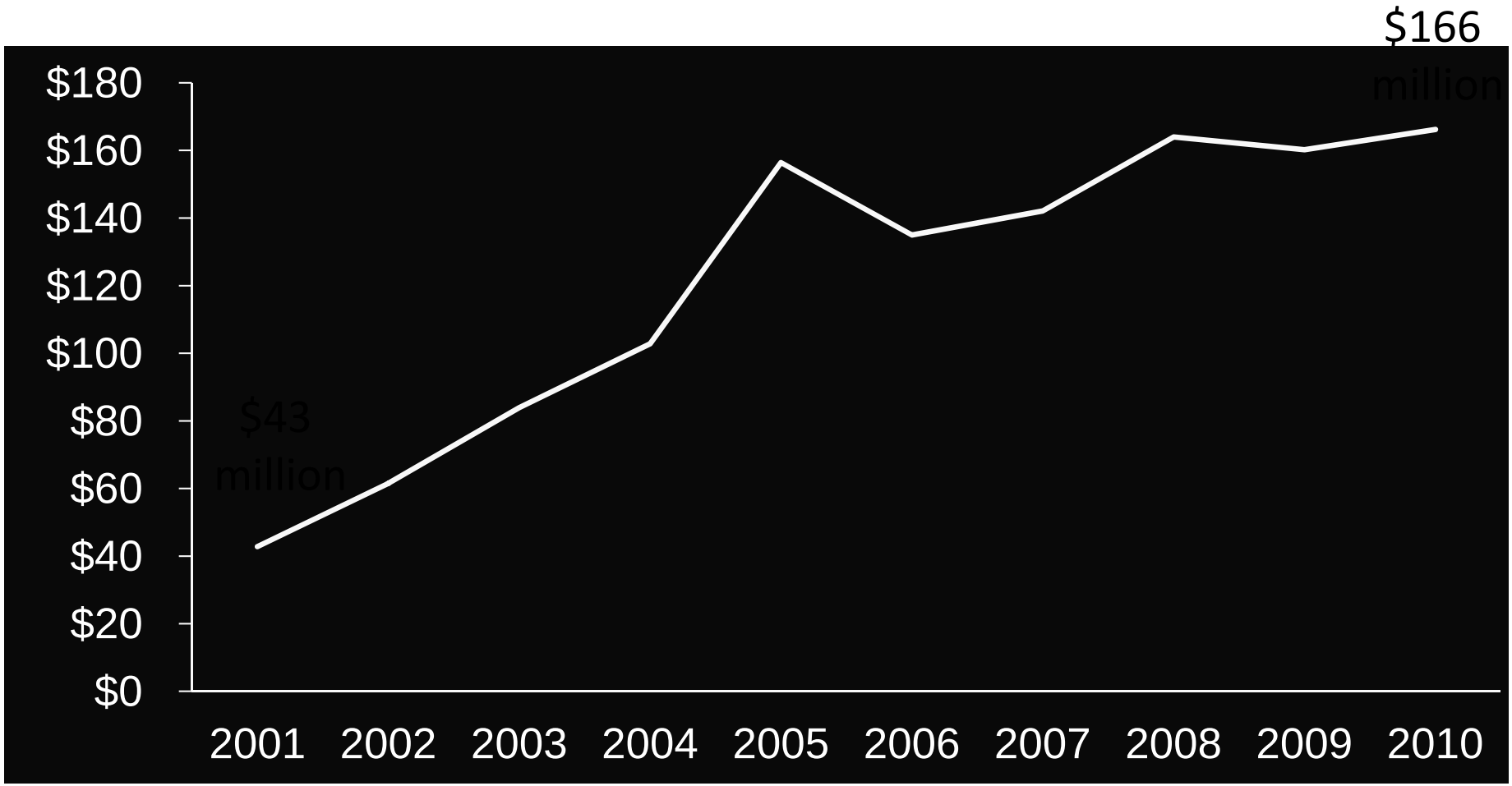
Total VA Health Expenditures on ICD-Related Care (2010 $millions), 2001-10



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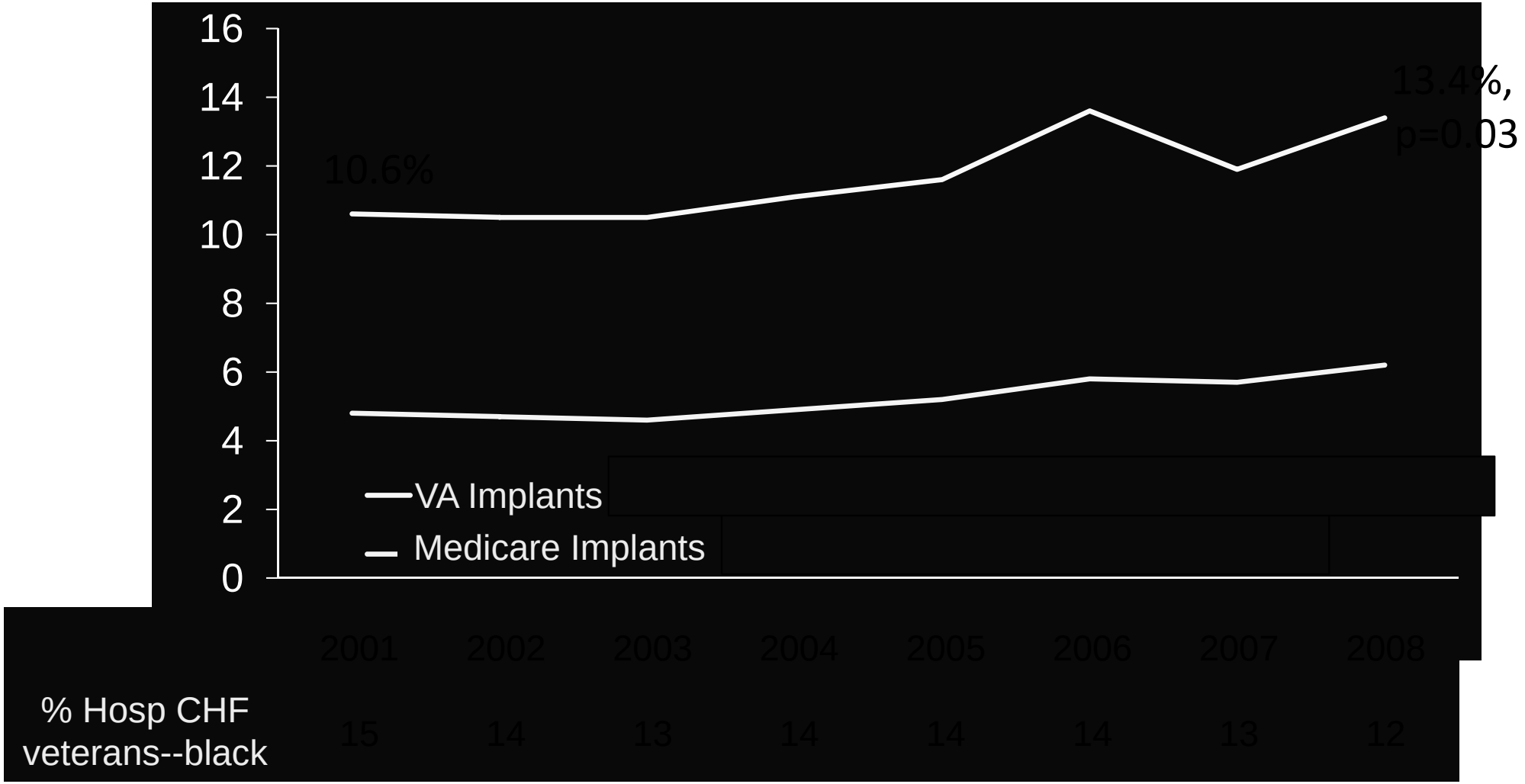
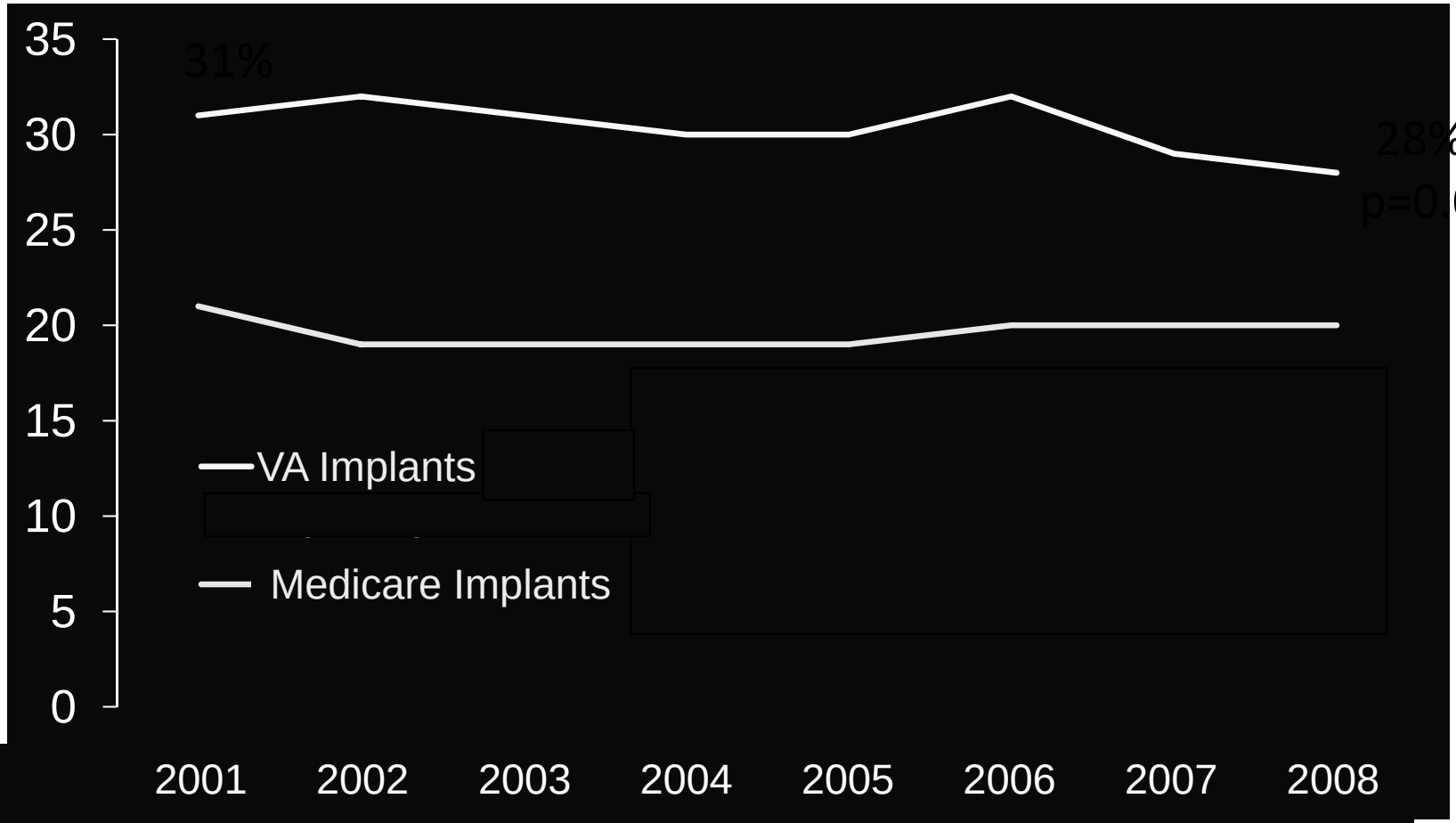
ICD Implant Rates in Black Veterans: VA and Medicare



ICD Implant Rates in SES Veterans: VA and Medicare



% Hosp CHF
Veterans Low-SES

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Conclusions – Volume of Care

- VA ICD implant rates increased substantially from 2001-2005, but plateaued from 2005-2010 at approximately 2,250 implants/year
- The number of unique veterans with ICDs who receive care in VA annually has increased steadily throughout the last decade; these veterans now number ~30,000
- Sizeable numbers of veterans with ICDs had their devices implanted outside VA

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Conclusions - Costs

- Average VA inflation-adjusted cost of ICD implantation increased significantly from $50,500 in 2001 to $64,600 in 2010
- Total VA expenditures on ICD care increased markedly, from $43 million to $166 million from 2001-2010
- At least $14 million in annual VA healthcare costs result from ICD care for veterans who did not receive their devices in VA

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Conclusions – defibrillators for minority veterans

- The % of VA ICD recipients who were black increased significantly from 2001 to 2008
- VA implanted ICDs in a higher % of black veterans than in the Medicare program
- VA's black ICD-implant % in 2008 approximates the % of VA's hospitalized CHF patients who are black

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Conclusions – Defibrillators for low-SES veterans

- The % of VA ICD recipients who were from low-SES ZIP codes decreased slightly from 2001 to 2008
- VA implanted ICDs in a higher % of low-SES veterans than in the Medicare program
- Low-SES ICD implant rates in VA were comparable to the % of low-SES veterans hospitalized with CHF

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Limitations

- VA records may not accurately capture all ICD implantations (e.g., contracted care)
- Cost attribution to ICDs was inexact—these patients often have multiple chronic conditions and thus it is possible costs were measured with error
- There are no indicators of appropriate use of ICDs in either VA or Medicare data, thus it is uncertain if ICDs were underused or overused

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Impact of these findings on VA

- ICDs were a source of significant cost growth that was unlikely to have been anticipated in 2001
- Despite growing volume of ICD care and high costs, there are no widely available sources of VA data about clinical appropriateness/ outcomes of VA's ICD implants
- VA often inherits the care (and costs) of implantable technology from other health systems

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VA's Technology Imperative

- Costly implantable devices are likely to continue to be introduced as routine components of high-quality care
- VA must balance the need to practice state-of-the-art medicine with the imperative to limit healthcare spending on technology
- VA must likewise ensure that disadvantaged veterans continue to receive high-technology care equal in quality to other veterans

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Summary

- ICD implantation rates and the # of veterans who receive routine defibrillator care have risen dramatically in VA during past decade
- VA's ICD-related healthcare costs have also risen sharply over time
- VA appears to be delivering equitable high-technology care to disadvantaged populations

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