

*Brief Summary of*  
Auction Design for Medicare  
Durable Medical Equipment

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*Updates at [www.cramton.umd.edu/papers/health-care](http://www.cramton.umd.edu/papers/health-care)*

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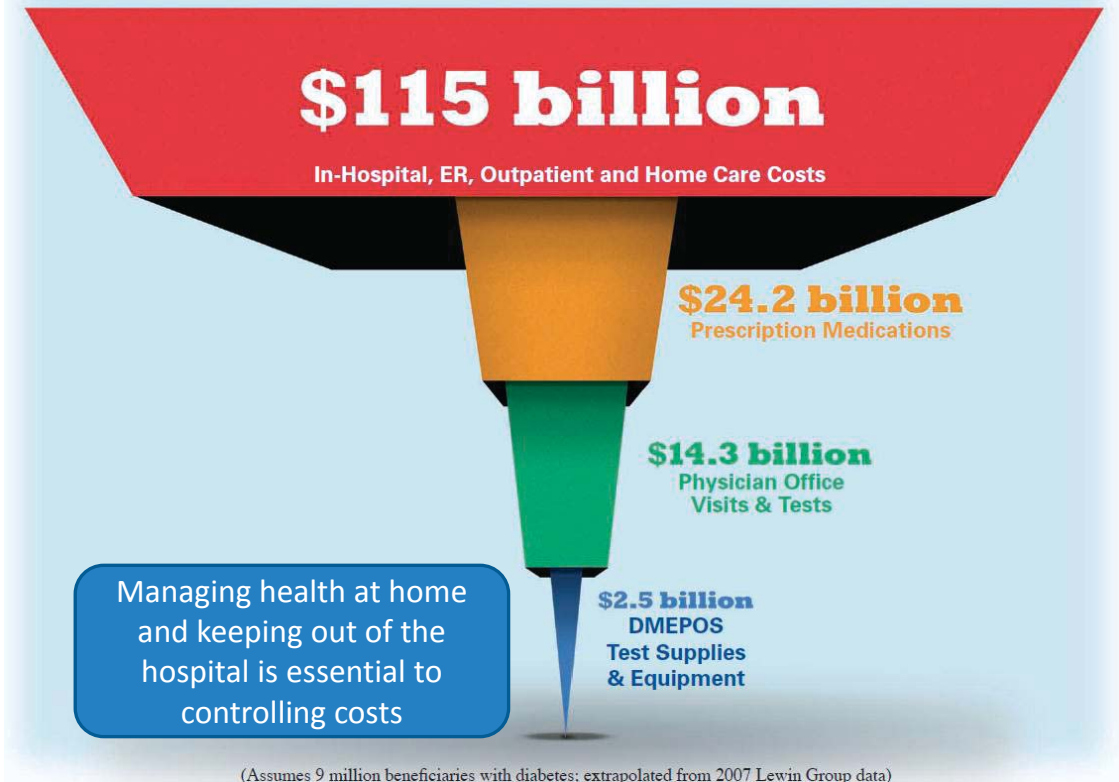
Unfunded  
Medicare  
expenses

**About \$70 Trillion!**

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# Diabetes Medicare costs

2007 Total Estimated Healthcare Costs for Medicare Beneficiaries with Diabetes



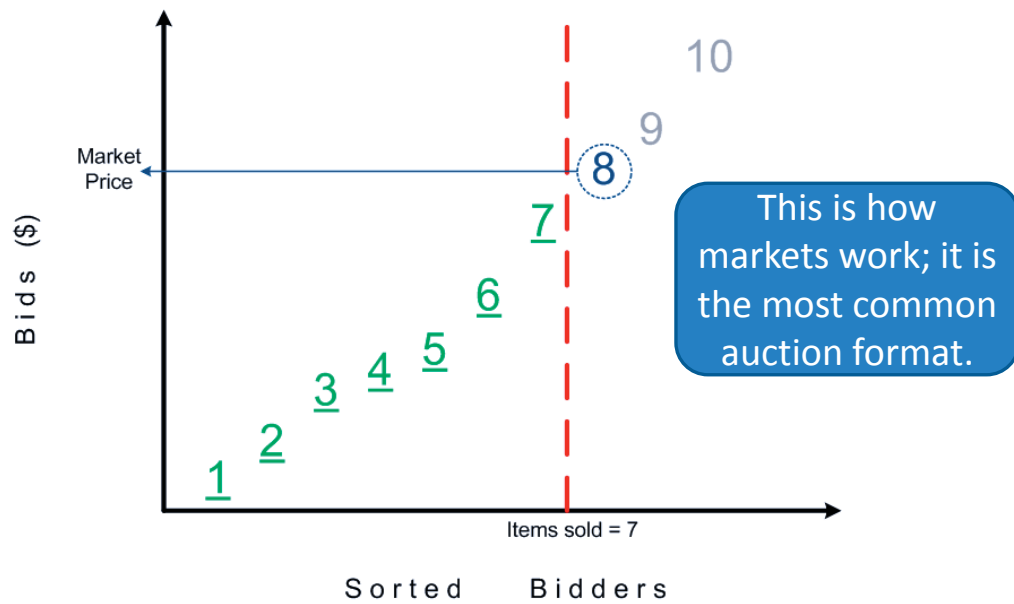
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# CMS design flaws

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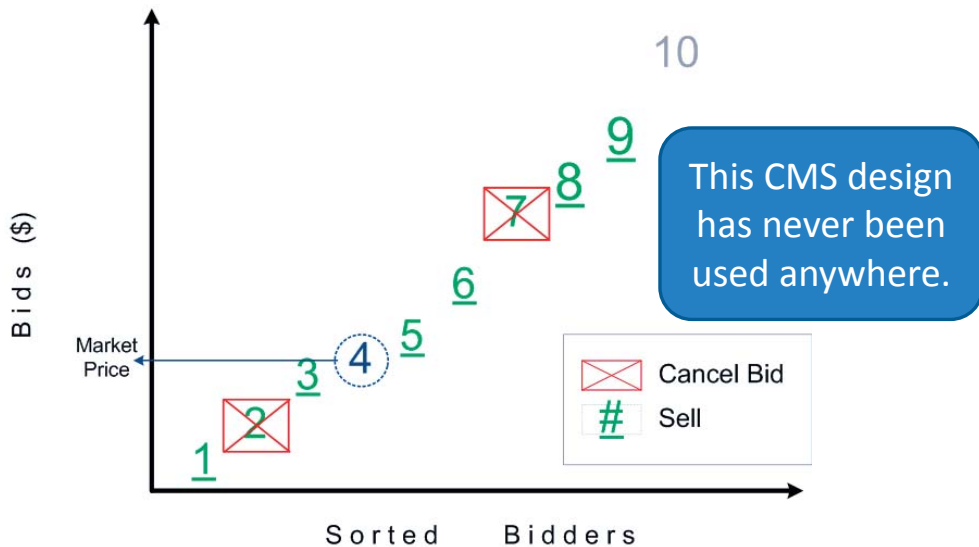
An efficient “clearing-price auction”:  
demand = 7; price = 8<sup>th</sup> lowest bid

### FIRST EXCLUDED BID



Inefficient CMS auction:  
demand = 7; price = 4<sup>th</sup> lowest bid

### MEDIAN PRICE WITH CANCELATION



## Median pricing rule together with non-binding bids creates strong incentive for low-ball bids

- Submitting a low-ball bid is a good strategy
  - Bid has a negligible impact on the price paid
  - Gives the bidder the option to sign a supply contract if the price is sufficiently attractive
- Adverse selection:
  - Low-ball strategy especially attractive for*
    - *Small and less informed bidders who don't have the time or resources to adopt a more sophisticated strategy*
    - *Desperate bidders on verge of bankruptcy*
    - *Low-quality bidders more apt to engage in fraud or corruption*
- If more than 50% of the bidders (by number, not volume) submit low-ball bids, then the price will be unsustainably low, leading to shortages, poor service, fraud and corruption
- *Prices are not related to costs*

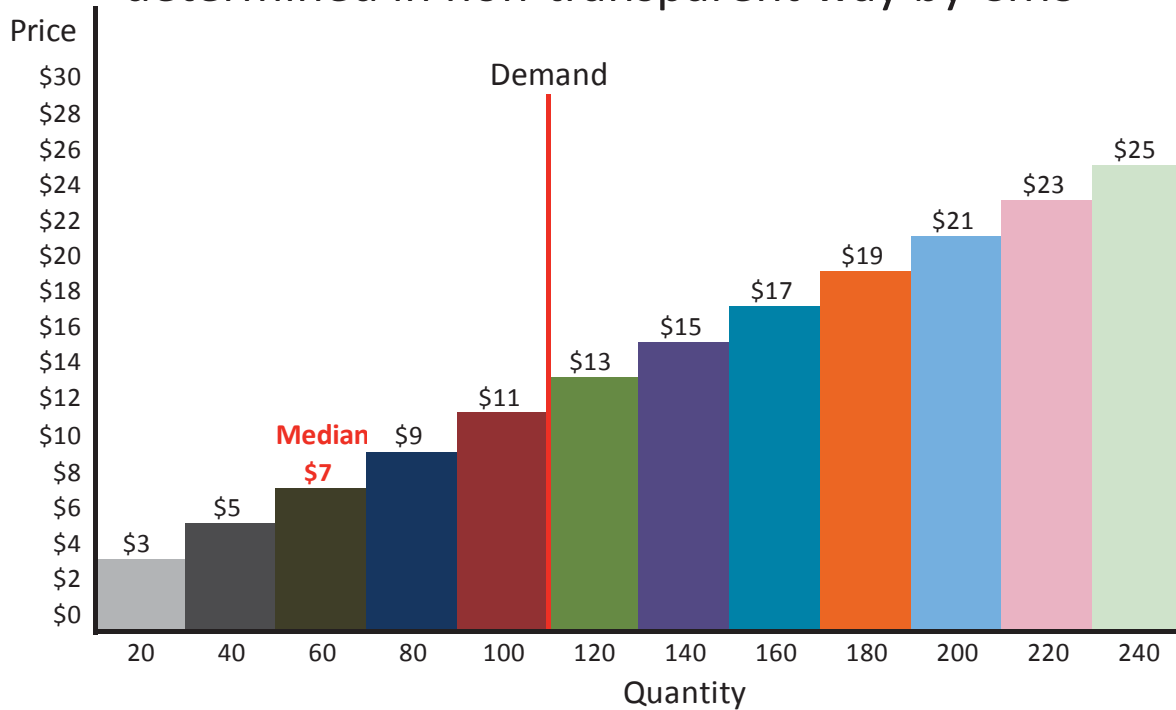
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## Lack of transparency

- Unclear how bidder quantities are determined
  - Critical input in pricing and winner determination
  - *Pricing becomes arbitrary decision of CMS*
- Winners not disclosed until 1 year after bids taken in November 2009
- Unclear quality standards
- Unclear performance obligation
- *Lack of transparency makes auction vulnerable to litigation* (see <http://goo.gl/utflq>)

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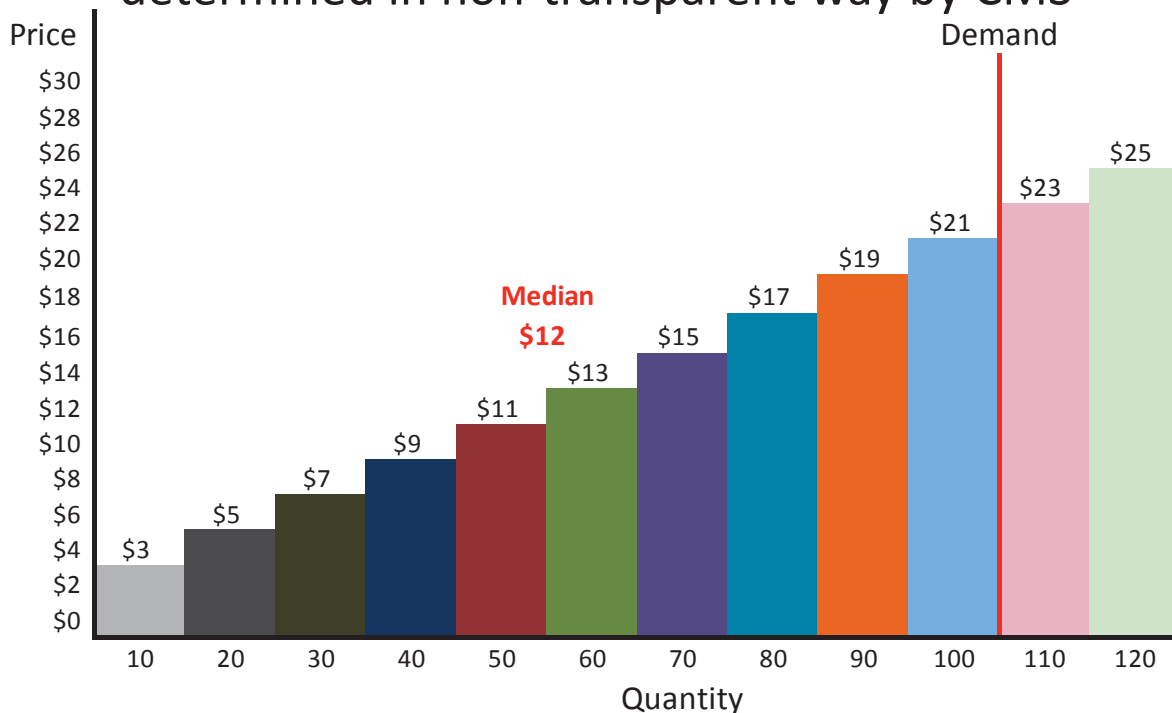
## Pricing is arbitrary, since bidder quantities determined in non-transparent way by CMS



Median = \$7 when CMS does not discount quantities at all.

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## Pricing is arbitrary, since bidder quantities determined in non-transparent way by CMS



Median = \$12 when CMS discounts quantities by 50%.

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## Evidence of program failure extremely strong

- Theory
  - Equilibria of CMS auction are at best strategically chaotic
  - Most plausible equilibrium results in complete market failure
- Experiment
  - Lab experiments at Caltech clearly demonstrate poor performance in a simplified environment
  - Lab experiments at Maryland further demonstrate poor performance in additional environments
- Field
  - Experience with pilots in 2008 and 2009 suggests failure

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# Part 1: Summary

Competitive bidding can result in large cost reductions without sacrificing quality, *but it must be done right!*

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## Proposed design addresses flaws in CMS program

- Bids are binding commitments
  - Each bid binds the bidder to particular performance obligations depending on the auction outcome
  - Bids are made credible through
    - *Rigorous qualification one month before auction*
    - *Bid bond proportional to bidder's capacity*
      - Returned to losing bidders at end of auction
      - Returned to winning bidders after posting performance guarantee
    - *Performance bond proportional to a winner's capacity*
      - Returned when performance obligation met
  - Financial guarantees add a modest cost but protect legitimate HME providers from being crowded out by poor or fraudulent suppliers
    - Engages competitive banking market in financial review
    - Banking and capital markets determine worthy providers, not CMS
- Auction establishes market clearing price for each item defined by product and region
  - Price paid to all providers is the clearing price that balances supply and demand
  - Prices found in a simple price discovery process that allows for both substitution and complementarities across categories
  - *Prices are not capped at current levels*

HME = Home Medical Equipment = DME; CMS = Centers for Medicare & Medicaid Services 13

## Capacities based on historic supply

- Each existing provider is assigned a capacity based on its supply for category and region in prior 3 years, with most recent year given most weight (one block of capacity is about 1 percent of total volume)
- Each qualified new provider is assigned a capacity of 1 block (about 1 percent)
- Variation: the number of blocks can vary from 100 to 200 depending on the product-region to allow for different market sizes and minimum efficient scales
- *Any provider may supply more than its capacity, but its capacity is assumed in matching supply and demand and in setting performance obligations*
- *Capacities are determined in objective manner*

## Auction competition comes from new entrants

- Since capacities of existing providers are set to equal approximately 100 blocks (100% of demand), excess supply comes from the desire of new entrants to supply at the current auction price
- The price keeps declining until new entrants are unwilling to supply or a sufficient quantity of existing providers exit the market to offset the new entry
- Given relatively low entry costs, especially from providers supplying in other regions or other categories, ample new entry can be expected at prices above competitive levels
- Financial guarantees assure bidders exit at prices below competitive levels

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## Winning bidders and prices

- As soon as supply falls to 100 blocks or less, the clearing price is set at the exit bid of the bidder that caused supply to fall to 100 or less
- Each bidder still in wins its capacity
- If supply is less than 100 blocks, the blocks won is scaled up to  $100/\text{Supply}$   
Example: If with supply at 101, a bidder with 10 blocks exits at \$34 and supply falls to 91; the clearing price is \$34; and block won are scaled-up by  $100/91$
- If multiple bidders exit at the clearing price, then exits are accepted to minimize the shortfall from 100 blocks (larger bidders first in event of tie)

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## Post-auction competition motivates quality

- After the auction, the winners compete for Medicare beneficiaries by offering quality products and services
- An HME provider offering better quality will increase market share, which will lead to a higher capacity in future auctions
- Medicare beneficiary choice is not only maintained but is an important driver to motivate providers to provide high quality products and services

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## Prices of individual products are relative to the price of the lead product in the category

- For each category, lead product is the product with the greatest dollar volume based on 2009 data or greatest correlation with cost of other products in category
- In qualification stage, for each category of interest, the bidder reports the relative price of each product as a percentage of the lead product's price
- The auctioneer computes the relative price index for the category as the capacity-weighted average of the bidder reports
- *The auction determines the price of each lead product in each category; other individual product prices are determined from the relative price index*
  - Example: Oxygen concentrator = \$100; portable gas cylinders have a relative price of 15%, so are priced at \$15

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# Optimization of categories, products, and regions

- As a result of medical innovation, new products will be introduced and some old products will be eliminated
  - This evolution of products to conform to state-of-the-art practices is essential
- Regions are an aggregation of adjacent counties within a particular state for which cost factors are quite similar
- Product categories are defined to include a set of highly complementary products
- Absolute prices for products within a particular category should tend to move together
  - If they do not, then the category should be split into multiple categories that do share within-category price movement
- *Product categories, products, and regions should be re-optimized for the new auction approach*
  - *The approach can easily accommodate more product categories, products, and regions*
  - *Optimization of categories, products, and regions is an essential task in the product design step with major input from HME providers*

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## Version 1: 100% auctioned on rotating basis

- Each year one-third of regions are auctioned with 3-year contracts
  - 3 groups of regions (West, Central, East)
    - Structure facilitates capture of geographic complementarities
  - 1 group auctioned each year
  - Establishes competitive prices in area for 3 years
  - Losers are excluded from supply in area
    - *Provides incentive to stay in auction*
- Variation: each year one-half of regions are auctioned with 2-year contracts
  - Shorter commitment period encourages flexibility and entry
- In either case, contract commitment extends to term of agreement with individual patients
  - Example: In last month of contract, provider supplies hospital bed to patient under 12-month rental agreement; provider is committed to patient regardless of whether the provider wins a supply contract in the next round

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*Preferred variation:  
Auction a representative 10% each year*

- Approach does not disrupt market structure
  - Emphasis is on establishing competitive prices, rather than excluding suppliers
- Apply competitive bid-based prices to non-auctioned areas
  - Auction a representative 10% of regions each year
    - Auction establishes prices in remaining 80% with a simple econometric model based on the two most recent auctions
    - Each year a different 10% is used, so over 10 years each region is auctioned once
  - In auctioned regions, only winners can supply during the two-year commitment period
    - Winners still must compete within the region
  - *Any certified supplier can supply in any non-auctioned region (80% of country)*

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*Auction is easy for bidders*

- Price process is easy for bidders to manage
  - Bidders interested in a particular category can focus on that category in all areas
  - Bidders interested in a particular region can focus on that area in all categories
  - Bidders with other interests can focus on the most relevant categories and areas for them
- Auction completes in a single day (or perhaps two for initial auction)
- Auction system is easy to use and requires no special software; a modern browser is all that is required
- Proxy bids allow small bidders to bid as in a sealed-bid auction

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## *Auction is highly transparent*

- Qualification and financial guarantees are reported publicly well in advance of the auction
- Capacities determined in objective manner
- Auction rules including product definitions, performance obligations, and penalties are known two months before auction
- Following each bidding round, excess supply at current prices as well as prices for next round are publicly announced
- Winners and quantity won are immediately announced at the conclusion of the auction
- The auction results are certified by CMS within 48 hours of the auction end
- An independent market monitor reports on auction outcome and any problems within two weeks of auction end

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## Proposed design based on proven methods

- Clearing price *approach used almost universally across all countries and industries*
  - Clearing price balances supply and demand
  - Leads to efficient assignment of supply to demand
- Simultaneous descending clock format has outstanding price discovery
  - Allows simple arbitrage across substitutes
  - Allows acquisition of a complementary portfolio of product categories
  - Efficiently aggregates information among many bidders to reduce the possibility of winner's curse
  - *Approach proven in hundreds of auctions for spectrum, electricity, gas, diamonds, emission allowances, etc.*

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## Proposed design based on proven methods

- Bidders are bound by bid bonds and performance bonds to guarantee the integrity of the bidding, *as in all well run auctions*
- Relative price index used to 1) assure bidders win complementary within-category products and 2) greatly simplify auction and improve liquidity
  - Approach use with great success in rough diamond auctions (BHP Billiton, since 2008) and electricity auctions (EDF, since 2001)
- *Transparent auctions commonly used in highly successful government auctions*
  - FCC spectrum auctions, since 1994
  - Electricity auctions regulated by FERC, since 1998, in CAISO, ERCOT, ISO-NE, Midwest ISO, NY ISO, PJM
  - Emission auctions conducted by RGGI (carbon), since 2008
- *In sharp contrast, the CMS design with non-binding bids and the median pricing rule has never been used in any country or industry*

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## How best to get to the long-run solution?

- Transition to an efficient auction as soon as possible
  - Substantial evidence that prices from November 2009 are erroneous
    - Theory (Cramton and Katzman 2010)
    - Caltech experiments (Merlob et al. 2010)
    - CMS red flags about program integrity
    - Radical change in market structure (Cramton 2010)
  - Savings will be greatest the sooner we move to a sustainable auction that identifies competitive prices and least-cost suppliers

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## How best to get to the long-run solution?

- Design automatically starts small even though it is applied nationwide
  - Only a small fraction of regions auctioned each year
- With prompt action by CMS first auction could take place in fourth quarter 2011 for 1 January 2012 start
  - *Well-designed auction greatly reduces staff time spent on*
    - *Addressing disputes*
    - *Managing fraud and abuse*
    - *Putting out fires*
  - *Well-designed auction enables CMS staff to focus on critical tasks of*
    - *Qualification*
    - *Guarantees*
    - *Performance monitoring*

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## *Next step: Medicare auction conference*

- An opportunity for collaboration among
  - DME providers
  - Medicare beneficiaries
  - Government agencies (HHS, CMS, CBO, OMB, CEA)
  - Congressional staff
  - Auction experts
- Key goals
  - To discuss key issues of an auction approach
  - To demonstrate how an efficient auction works
  - To debate the merits of the auction approach

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# Medicare auction conference

- Sponsors

- National Science Foundation
- University of Maryland



- Date and venue

- 8:30am to 5pm, Friday, 1 April 2011
- Inn and Conference Center, University of Maryland College Park MD
- About 110 participants  
(40 government, 70 non-government)

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## Medicare auction conference: Outline

- *Registration and Breakfast (8am)*
- Welcome (8:30am)
  - Peter Cramton, Professor of Economics, *University of Maryland*
  - Jonathan Blum, Deputy Administrator, *CMS*
- [A proposed auction approach for Round 2](#) (9am), Peter Cramton
  - How it works
  - Why it addresses the problems of the current CMS approach (Round 1 Rebid)
- *Morning break (9:45am)*
- Auction demonstration (10:15am), Peter Cramton and Larry Ausubel, *University of Maryland*
- A mock auction is conducted with all participants using the proposed rules and a commercial auction platform. Each team is given a specific business plan and asked to maximize profits. There are four steps:
  - Description of the mock auction environment
  - Description of the auction platform and the mechanics of bidding
  - Running of the auction (first few rounds)
- *Lunch (12:15pm) occurs after approximately 1 or 2 rounds of bidding*
- Running of the auction (remaining rounds) (1:15pm)
- Presentation of auction results
- *First panel: Sustainability, market structure, and beneficiary choice (2:15pm)*
- Moderated by Lance Leggitt, Chair, Federal Health Policy, *Baker Donelson*  
Paul Gabos, Chief Financial Officer, *Lincare*  
Amy Law, Vice President Government and Healthcare Strategy, *KCI, Inc.*  
Nancy Lutz, Program Director, Economics, *National Science Foundation*  
Joel Marx, Chairman, *Medical Service Company*  
Zachary Schiffman, President, *United States Medical Supply*

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# Medicare auction conference: Outline

- *Afternoon break (3pm)*
- *Second panel: Product design and ensuring performance (3:30pm)*
  - Optimization of products and regions
  - Financial guarantees (bid and performance bonds or deposits)
  - Moderated by Thomas Milam, Member of *Program Advisory and Oversight Committee (PAOC)*
    - Cara Bachenheimer, Senior Vice President Government Relations, *Invacare Corporation*
    - Michael Iskra, Chief Operating Officer, *Simplex Healthcare*
    - Scott Lloyd, Co-founder and President, *Extrakare LLC*
    - Mike Pfister, Executive Vice President Government Affairs, *The SCOOTER Store*
    - John Shirvinsky, Executive Director, *Pennsylvania Association of Medical Suppliers*
- *Final panel: What have we learned? (4:15pm)*
  - Moderated by Peter Cramton, Professor of Economics, *University of Maryland*
    - Tom Bradley, Chief, Medicare Cost Estimates, *Congressional Budget Office*
    - Walt Gorski, Vice President, Government Affairs, *American Association for Homecare*
    - Nancy Johnson, 24-year Congresswoman (R-CT), Senior Public Policy Advisor, *Baker Donelson*
    - Thomas Kruse, President and CEO, *Hoveround Corporation*
    - Evan Kwerel, Senior Economic Advisor, *Federal Communications Commission*
    - Wayne Sale, Chairman, *NAIMES*, and President and CEO, *Health First*
- *Conference end (5pm)*