

Brief Summary of
Auction Design for Medicare
Durable Medical Equipment

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Updates at www.cramton.umd.edu/papers/health-care

Unfunded Medicare expenses

About \$70 *Trillion!*

Diabetes Medicare costs

2007 Total Estimated Healthcare Costs for Medicare Beneficiaries with Diabetes

\$115 billion

In-Hospital, ER, Outpatient and Home Care Costs

\$24.2 billion
Prescription Medications

\$14.3 billion
Physician Office
Visits & Tests

\$2.5 billion
DMEPOS
Test Supplies
& Equipment

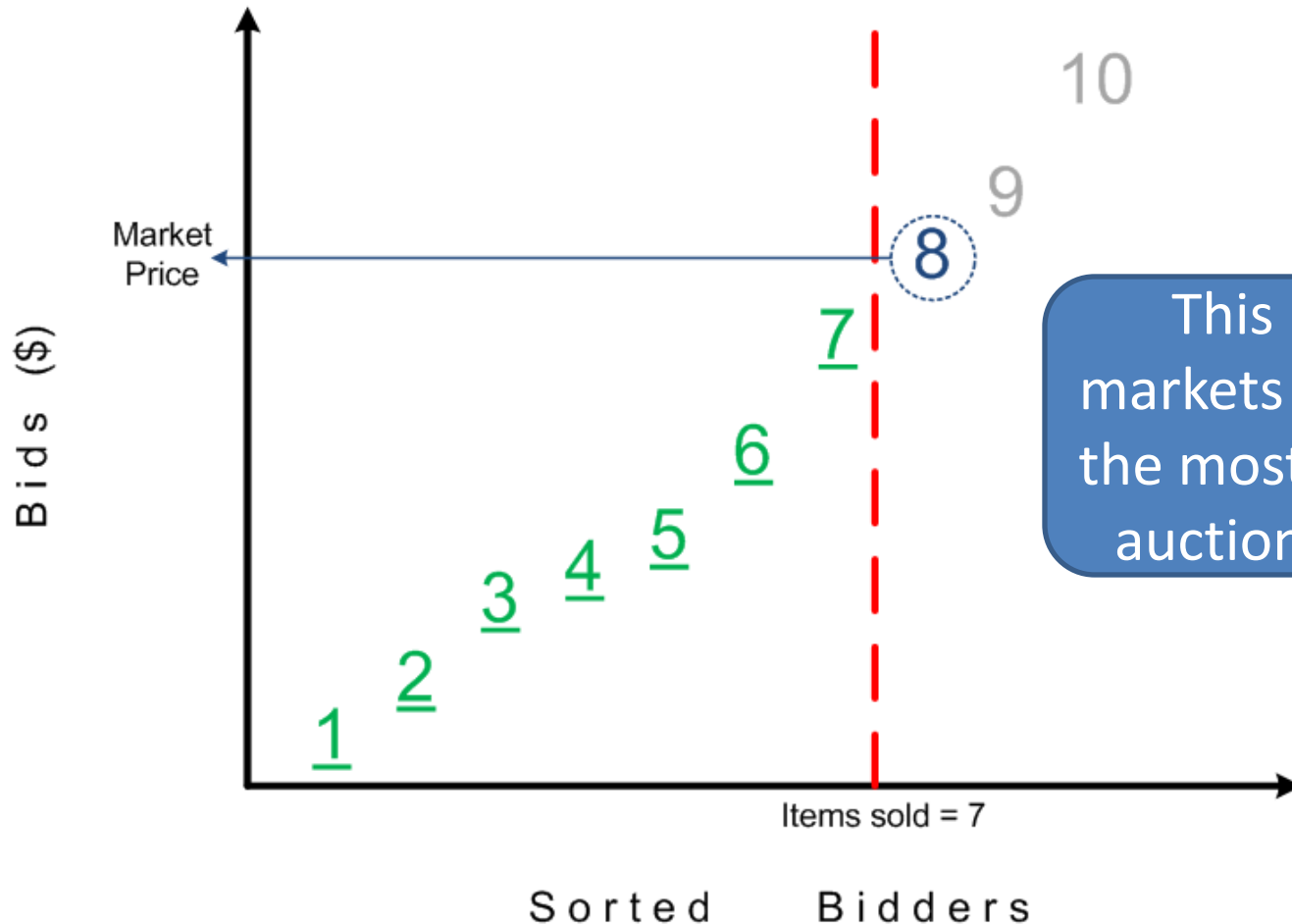
Managing health at home
and keeping out of the
hospital is essential to
controlling costs

(Assumes 9 million beneficiaries with diabetes; extrapolated from 2007 Lewin Group data)

CMS design flaws

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

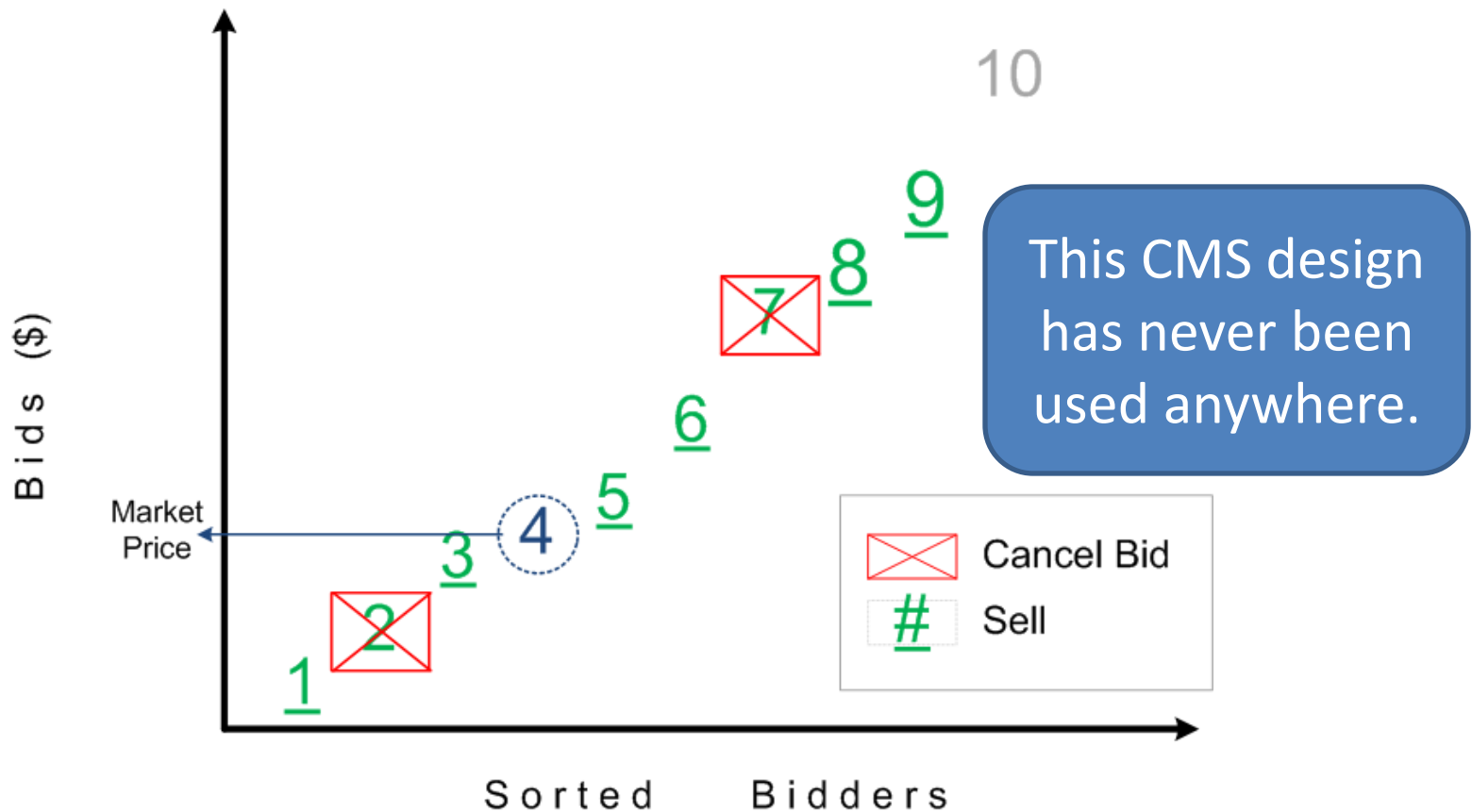
FIRST EXCLUDED BID



This is how markets work; it is the most common auction format.

Inefficient CMS auction:
demand = 7; price = 4th lowest bid

MEDIAN PRICE WITH CANCELATION



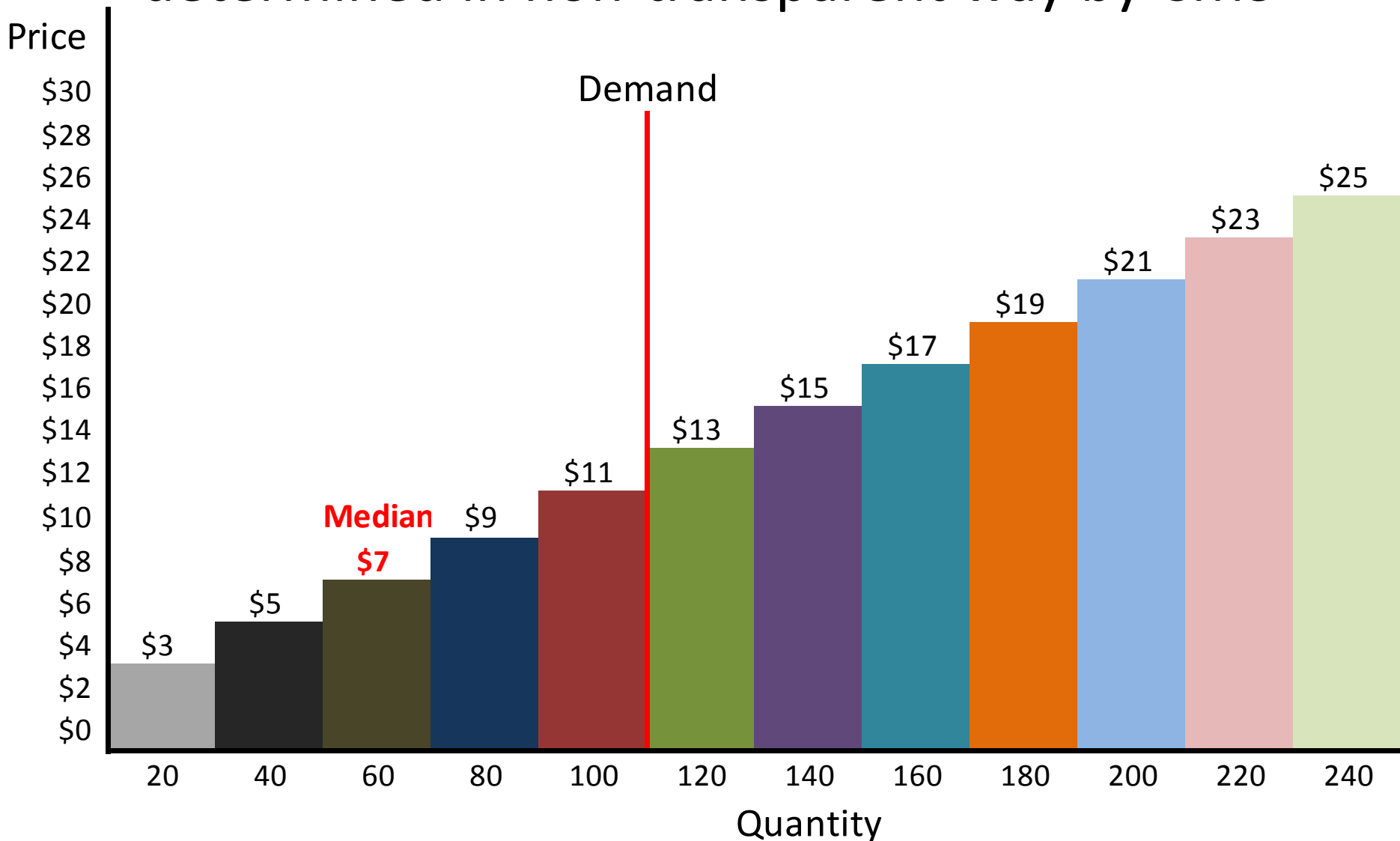
Median pricing rule together with non-binding bids creates strong incentive for low-ball bids

- 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*

Lack of transparency

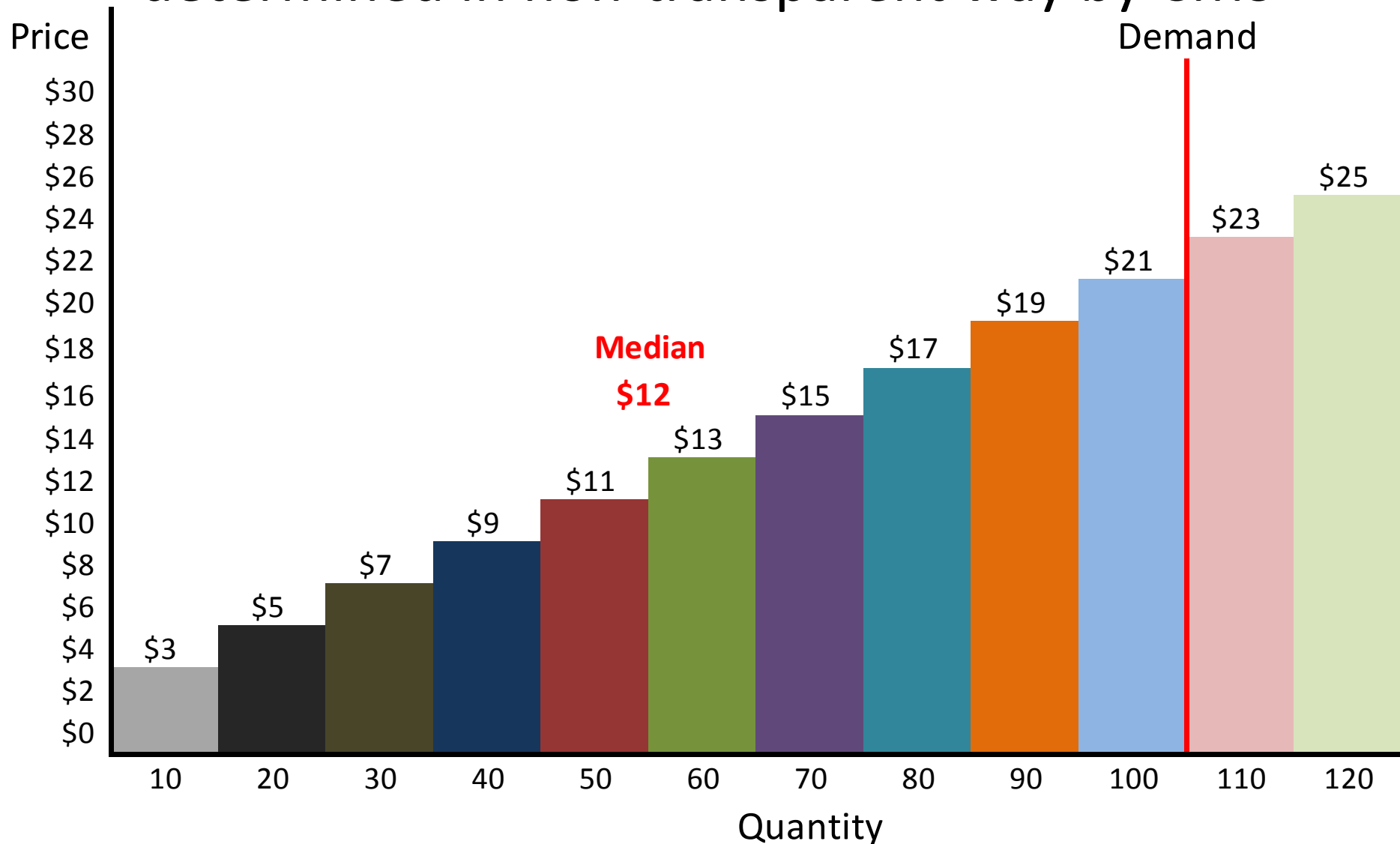
- Unclear how bidder quantities are determined
 - Critical input in pricing and winner determination
 - *Pricing becomes arbitrary decision of CMS*
- Winners not disclosed until 1 year after bids taken in November 2009
- Unclear quality standards
- Unclear performance obligation
- *Lack of transparency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

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



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

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



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

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

Part 1: Summary

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

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*

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

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)

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

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

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*

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

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)*

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

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

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.*

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*

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

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*

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

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)

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*

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)*