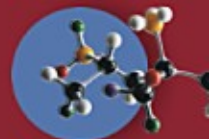


# IT Enabling Community Care

**Scottsdale Institute Spring Conference  
April 16-18, 2008**

At the Camelback Inn,  
A JW Marriott Resort & Spa  
Scottsdale, AZ

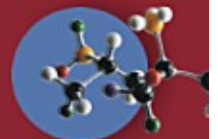


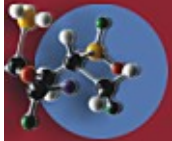
# The Value of Provider-to-Provider Telehealth

*Eric Pan, MD, MSc*

*Center for IT Leadership, Partners Healthcare*

*April 16, 2008*

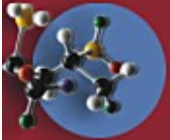




## Scope of the Project

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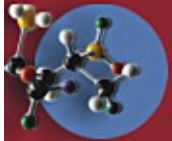
- ▶ Telehealth encounters in which there is a provider both on the near and on the far side
- ▶ Clinical encounters
- ▶ Utilization-based



## Three Technologies

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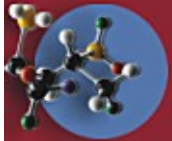
- ▶ **Store-and-Forward:** *The collection and storage of clinical data or images which is later forwarded for interpretation at a time distant from a face-to-face clinical encounter.*
- ▶ **Real-Time Video:** *An interactive clinical encounter performed using only live audio-video technologies.*
- ▶ **Hybrid:** *Hybrid technology integrates store-and-forward technology with real-time video technology.*



# Encounter Taxonomy

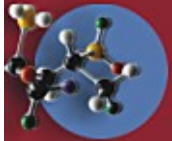
|   | <b>Emergent Setting</b> | <b>Non-Emergent Setting</b>    |
|---|-------------------------|--------------------------------|
| <b>Consult<br/>(CMA at near,<br/>patient side)</b>      | Real time               | Real time<br>Store-and-forward |
| <b>Provider<br/>Extension<br/>(CMA at far<br/>side)</b> | Real time               | Real time<br>Store-and-forward |

\*CMA = Controlling Medical Authority



# Telehealth Levels

|                            | Level     | Store-and-Forward  | Real Time  | Type of Data Transmitted                              | Minimum Bandwidth Kbit/s per Connection |
|----------------------------|-----------|--|--|---|---|
| <b>Advanced Telehealth</b> | <b>IV</b> | Convergence of traditional telehealth functionality throughout medicine, including integration with interoperable-EMR systems, such that a distinction between telehealth and traditional medicine becomes meaningless |  | Convergence: Images, high-resolution video, EHR       | High (512 kbit/s or greater)            |
|                            |           | <b>III</b>   | <b>Hybrid with high-resolution video and image</b> |   | <b>Images, high-resolution video</b>    |
| <b>Modern Telehealth</b>   | <b>II</b> | <b>a. High-resolution still images</b>   | <b>b. Low-resolution video</b>                     | <b>Images, low resolution video</b>                   | <b>Low (128 kbits/s)</b>                |
|                            | <b>I</b>  | Email of textual information   | Faxing of textual information                      | Electronic transmission of textual data               | Modem (<10 kbits/s)                     |
| <b>Pre-Telehealth</b>      | <b>0</b>  | Postal mail  | Verbal report via telephone                        | Traditional, non-electronic, methods of communication | Telephone network                       |



## Telehealth Cost-Benefit Model

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- ▶ Considers cost and benefits of telehealth technologies
- ▶ National results (Value=Benefit-Cost)
  - 100% Store and Forward
  - 100% Real Time Video
  - 100% Hybrid
- ▶ Projects net value over an initial 10-year implementation period as well as annual, steady-state net value after full implementation

# Avoided Transports Between Emergency Departments

|  | Store-and-Forward | Real-Time Video | Hybrid        |
|--|-------------------|-----------------|---------------|
| <b>Baseline Transports<br/>ED to ED</b>  | 2,204,320         |                 |               |
| <b>Pre-Telehealth<br/>Transport Cost</b> | \$1,390,000,000   |                 |               |
| <b>Avoided Transports<br/>ED to ED</b>   | N/A               | 646,000         | 850,000       |
| <b>Annual Telehealth<br/>Savings</b>     | N/A               | \$408,000,000   | \$537,000,000 |
| <b>Annual Telehealth<br/>Costs</b>       | N/A               | \$60,000,000    | \$64,000,000  |



## **Savings from Avoided Transports Between Emergency Departments**

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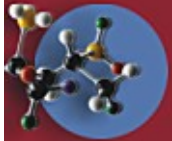
*From the prospective of the healthcare system, the cost to equip all US emergency departments with telehealth technologies could easily be covered by savings from a reduction in transfers between emergency departments.*

# Savings from Avoided Visits from Correctional Facility to EDs

|  | Store-and-Forward | Real-Time Video | Hybrid       |
|--|-------------------|-----------------|--------------|
| <b>Baseline Transport CF to ED</b>               | 94,180            |                 |              |
| <b>Pre-Telehealth Transport &amp; Visit Cost</b> | \$158,000,000     |                 |              |
| <b>Avoided Visits from CF to ED</b>              | N/A               | 34,900          | 39,900       |
| <b>Annual Telehealth Savings</b>                 | N/A               | \$51,700,000    | \$60,300,000 |
| <b>Annual Savings per Inmate</b>                 | N/A               | \$34            | \$40         |

# Savings from Avoided Visits from Correctional Facilities to MD offices

|  | Store-and-Forward | Real-Time Video | Hybrid        |
|--|-------------------|-----------------|---------------|
| <b>Baseline Transport CF to MD office</b>        | 691,000           |                 |               |
| <b>Pre-Telehealth Transport &amp; Visit Cost</b> | \$302,000,000     |                 |               |
| <b>Avoided Visits from CF to ED</b>              | 411,000           | 452,000         | 543,000       |
| <b>Annual Telehealth Savings</b>                 | \$162,000,000     | \$171,000,000   | \$210,000,000 |
| <b>Annual Savings per Inmate</b>                 | \$106             | \$112           | \$138         |



## Savings from Connecting Correctional Facilities to EDs and MD Offices

*Correctional facilities could cover their costs of telehealth equipment by savings from a reduction in transporting patients to emergency departments and to physician offices, and by avoiding the costs of the emergency department visit itself.*

# Savings from Avoided Visits from Nursing Facilities to EDs

|  | Store-and-Forward | Real-Time Video | Hybrid        |
|--|-------------------|-----------------|---------------|
| <b>Baseline Transport NF to ED</b>               | 2,699,000         |                 |               |
| <b>Pre-Telehealth Transport &amp; Visit Cost</b> | \$3,620,000,000   |                 |               |
| <b>Avoided Visits from NF to ED</b>              | N/A               | 34,900          | 39,900        |
| <b>Annual Telehealth Savings</b>                 | N/A               | \$259,000,000   | \$327,000,000 |
| <b>Annual Savings per Resident</b>               | N/A               | \$174           | \$219         |


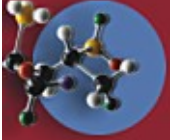
# Savings from Avoided Visits from Nursing Facilities to MD Offices

|  | Store-and-Forward | Real-Time Video | Hybrid        |
|--|-------------------|-----------------|---------------|
| <b>Baseline Transport NF to MD office</b>        | 10,100,000        |                 |               |
| <b>Pre-Telehealth Transport &amp; Visit Cost</b> | \$1,290,000,000   |                 |               |
| <b>Avoided Visits from NF to ED</b>              | 4,090,000         | 5,420,000       | 6,870,000     |
| <b>Annual Telehealth Savings</b>                 | \$261,000,000     | \$305,000,000   | \$479,000,000 |
| <b>Annual Savings per Resident</b>               | \$175             | \$204           | \$321         |



## Savings from Connecting Nursing Facilities to EDs and MD Offices

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*From the perspective of the healthcare system, the costs of implementing telehealth equipment in nursing homes could be covered by savings from a reduction in transferring residents to emergency departments and physician offices, and by avoiding the costs of the emergency department visit itself.*

# Benefit of Provider-to-Provider Tele-consultations

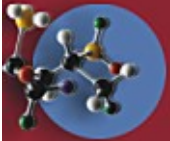
|  | Store-and-Forward<br>(Level IIa) | Real-Time Video<br>(Level IIb) | Hybrid<br>(Level III) |
|--|----------------------------------|--------------------------------|-----------------------|
| <b>Total Pre-Telehealth Costs</b>                                    | \$28,700,000,000                 |                                |                       |
| <b>Annual Savings from Avoided Face-to-Face Visits</b>               | \$468,000,000                    | (\$3,000,000,000)              | (\$1,620,000,000)     |
| <b>Annual Savings from Avoided Redundant &amp; Unnecessary Tests</b> | \$2,540,000,000                  | \$2,290,000,000                | \$5,230,000,000       |
| <b>Total Annual Telehealth Savings</b>                               | \$3,000,000,000                  | (\$709,000,000)                | \$3,610,000,000       |



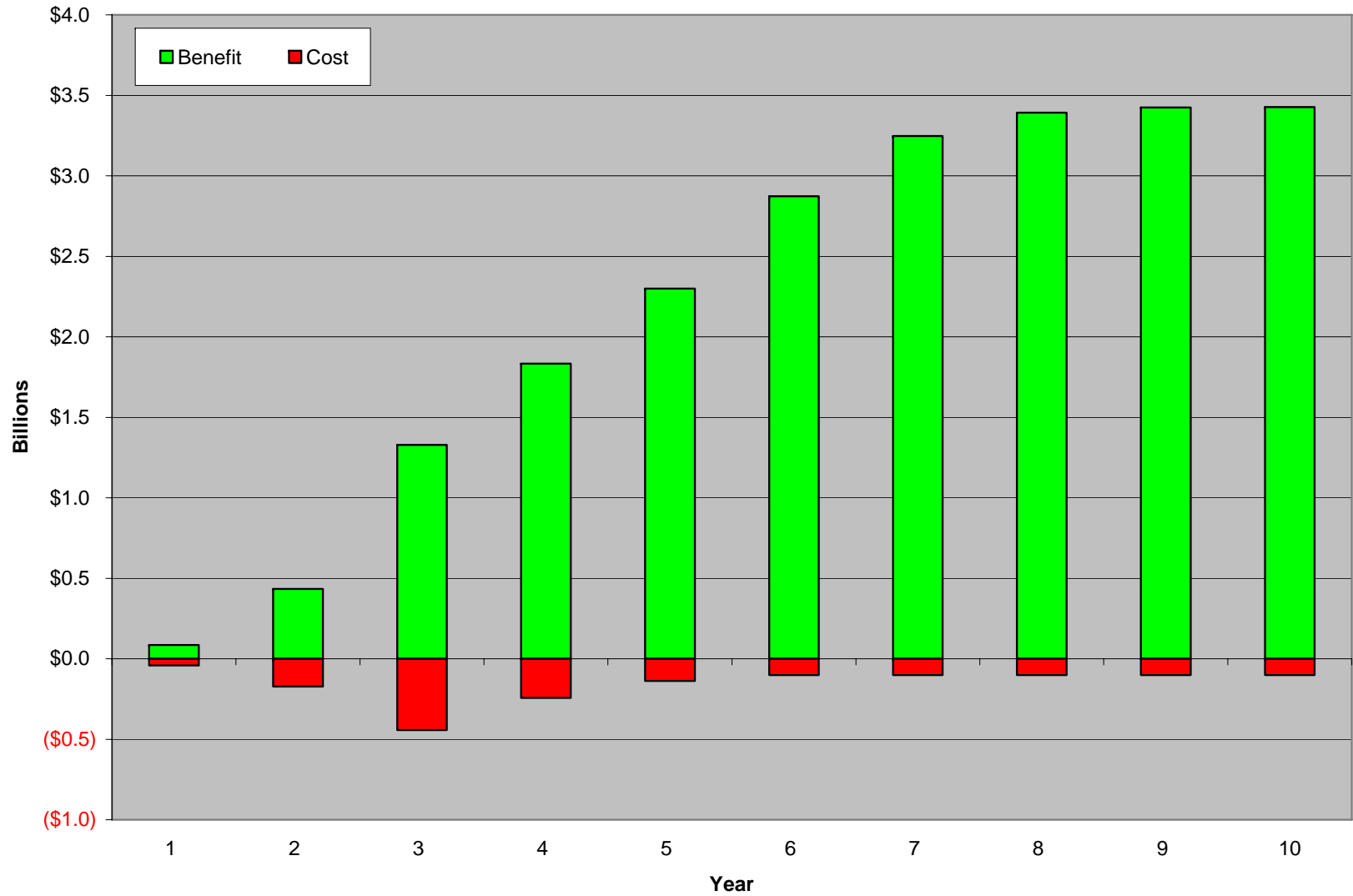
## Benefit of Provider-to-Provider Tele-consultations

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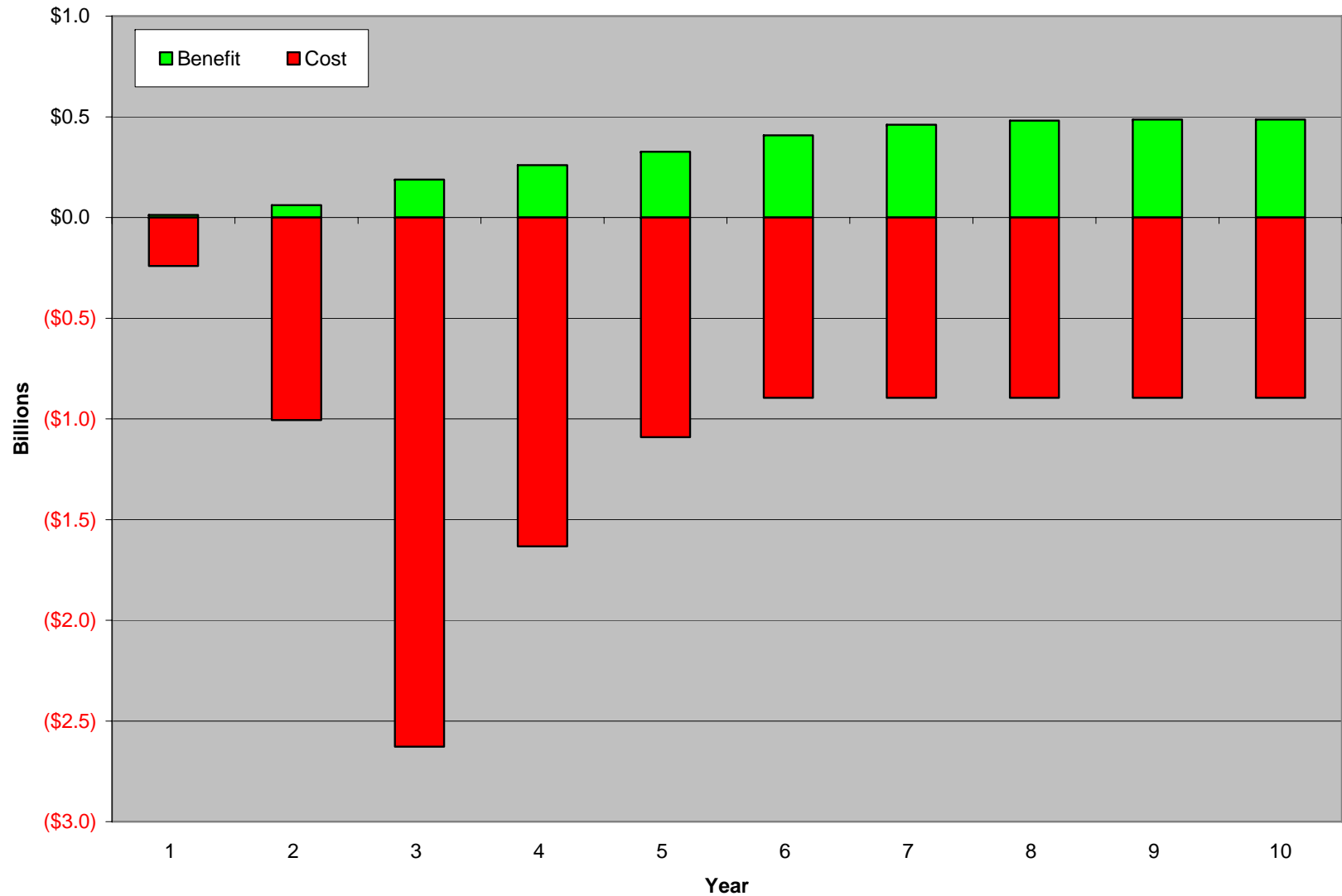
*There is a loss to the system from teleconsults with real-time video and hybrid technologies when considering only professional fees. These losses could be far outweighed in the hybrid scenario by involving specialists early in the care of a patient and reducing the number of redundant or unnecessary tests.*

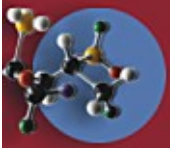


# National Annual Cost-Benefit Cashflow for Store-and-Forward (IIa)

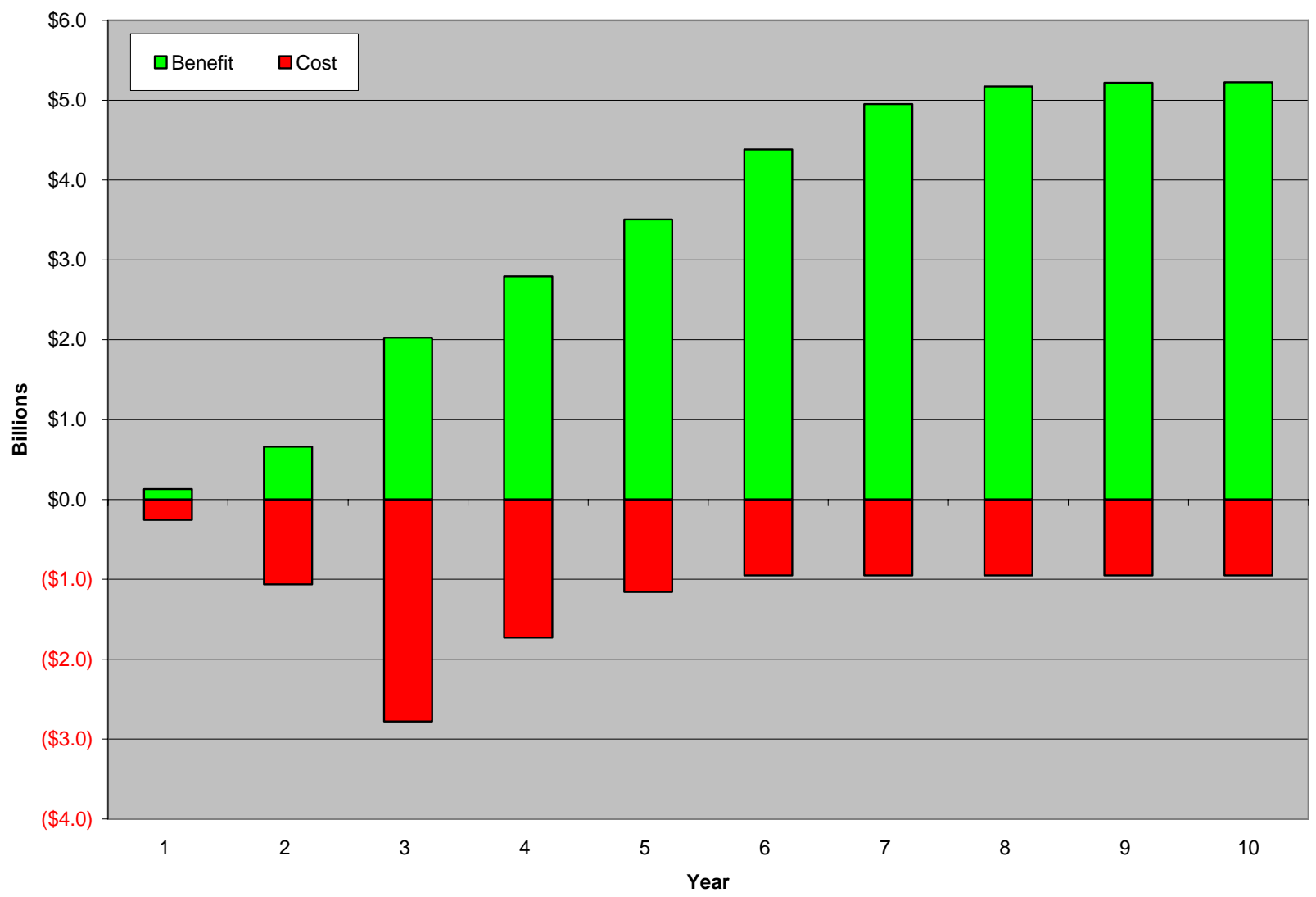


# National Annual Cost-Benefit Cashflow for Real-Time video (IIb)

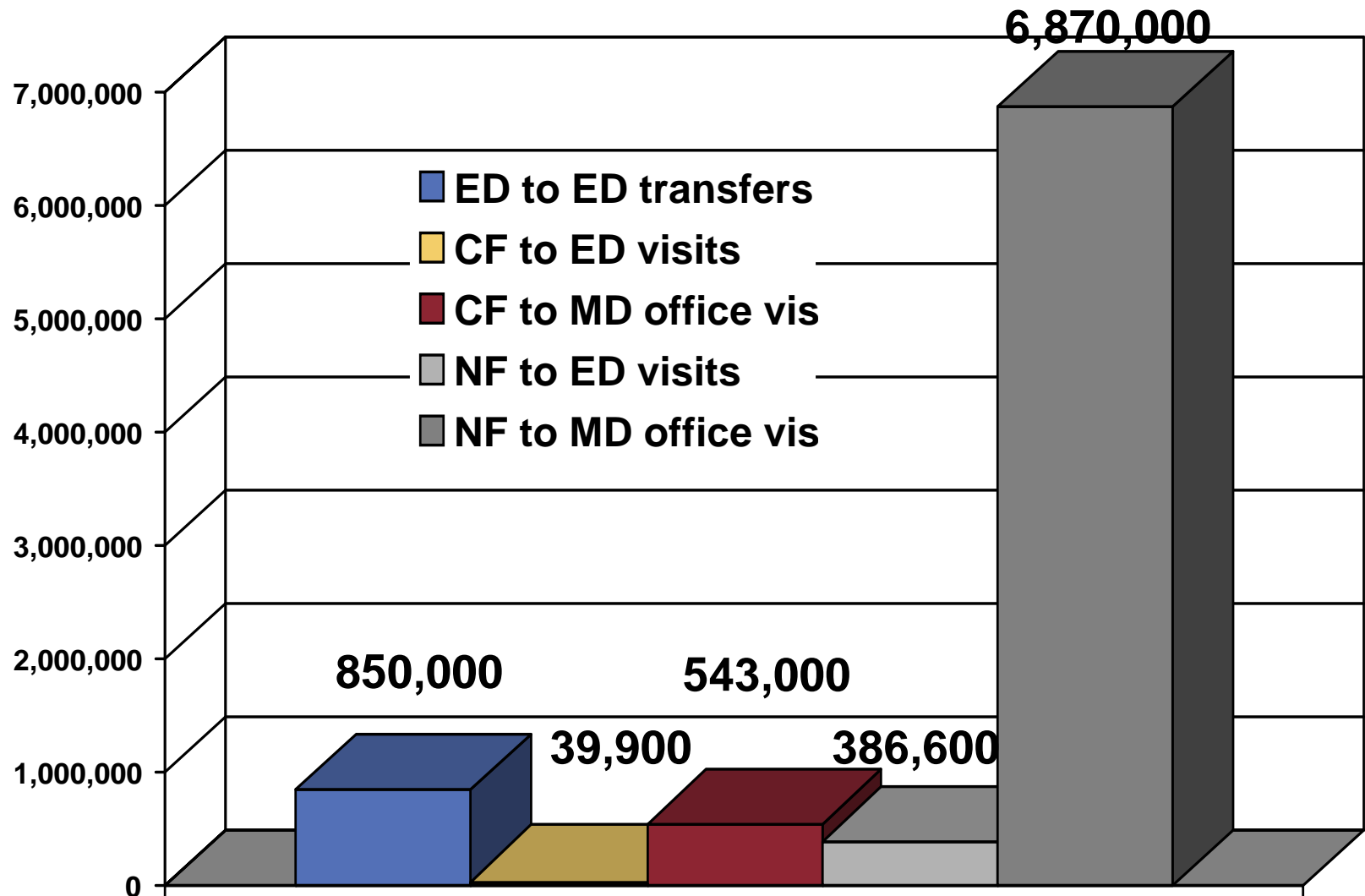




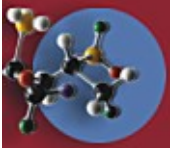
# National Annual Cost-Benefit Cashflow for Hybrid (III)



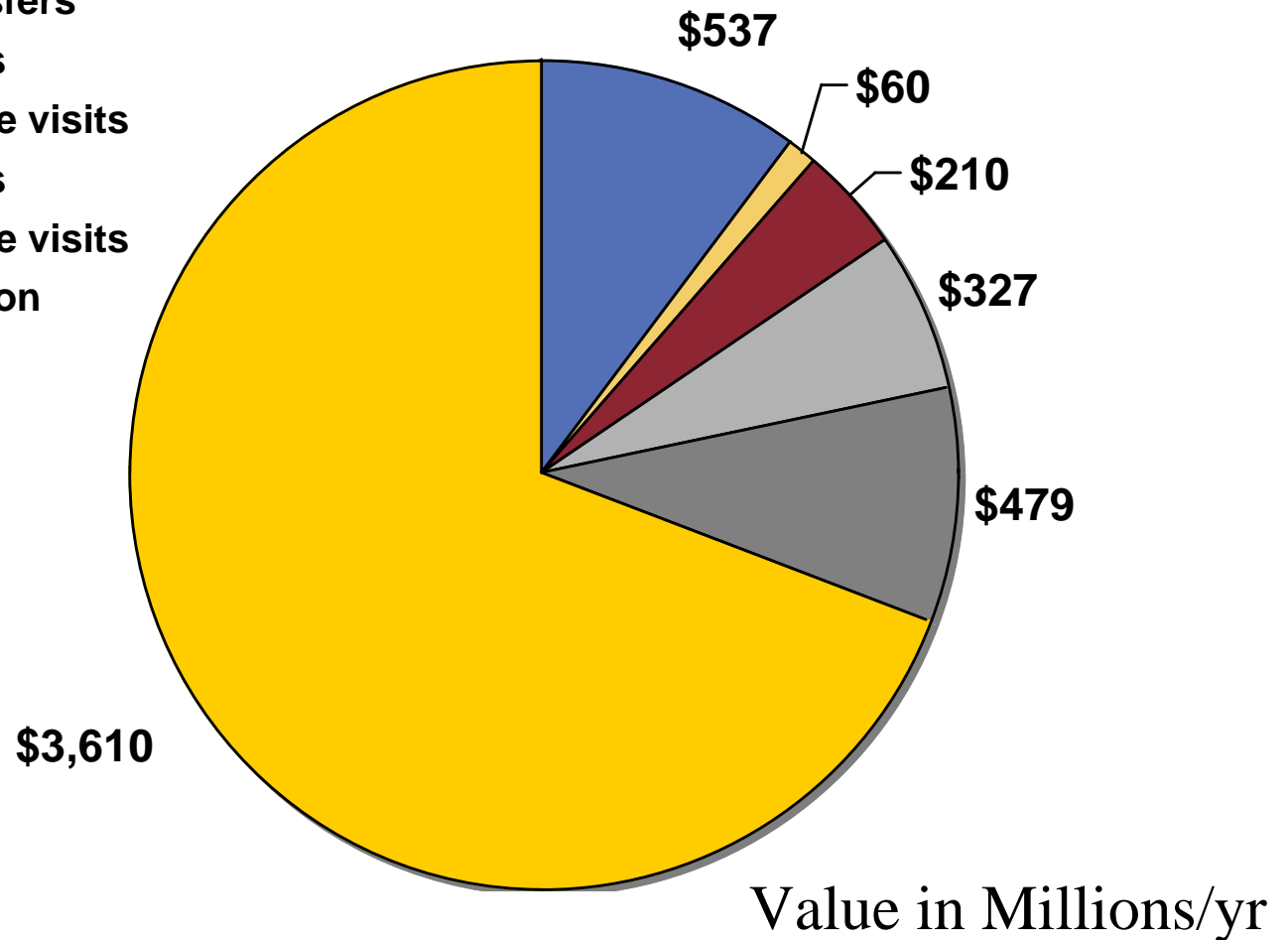
# Avoided Transports in National Hybrid deployment scenario

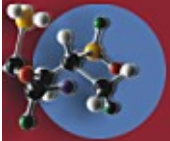


# Annual Savings in National Hybrid deployment scenario

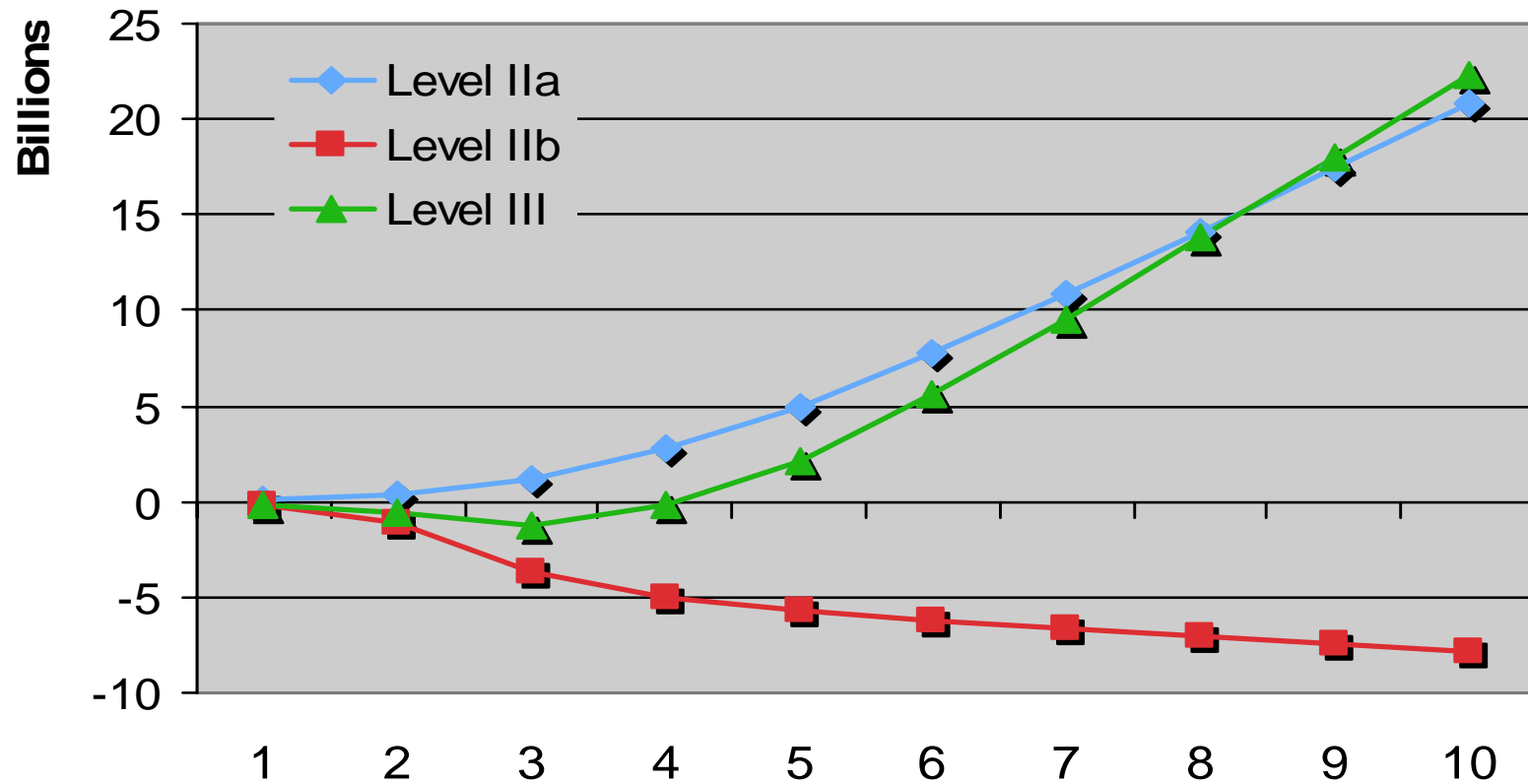


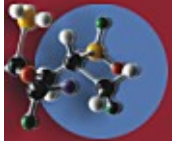
- ED to ED transfers
- CF to ED visits
- CF to MD office visits
- NF to ED visits
- NF to MD office visits
- Teleconsultation





# National Cumulative Net Value





## Summary of Results

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- ▶ Overall, the benefits far outweigh the costs of these systems to implement.
- ▶ Hybrid technologies projected to be the most cost-effective system.
- ▶ Sites with existing real-time video capabilities can upgrade to hybrid with minimal costs and reap significant benefits

***Thank You!!!***

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