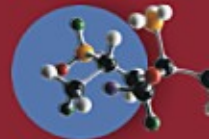


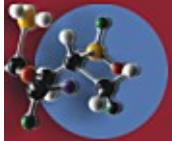
The Value of Provider-to-Provider Telehealth

Eric Pan, MD, MSc

Center for IT Leadership, Partners Healthcare

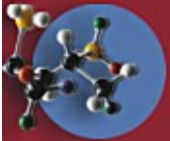
May 6, 2008





CITL Mission

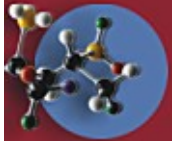
- ▶ Produce rigorous market-driven technology assessments which:
 - Help providers invest in HIT wisely
 - Help IT firms understand the value proposition
 - Help inform/shape public policy



HIT Value Modeling

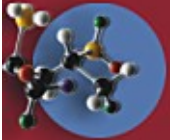
► Methodology:

- Choose a technology to study
- Conduct literature review, interviews of experts and vendors to determine where evidence exists to show value
- Use estimates from experts where data does not exist
- Build model in order to extrapolate evidence to the nation



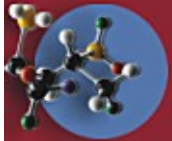
Scope of the Project

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



Three Technologies

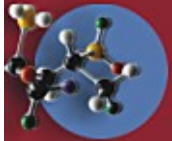
- ▶ **Store-and-Forward:** *The collection and storage of clinical data or images which is later forwarded for interpretation at a time distant from a face-to-face clinical encounter.*
- ▶ **Real-Time Video:** *An interactive clinical encounter performed using only live audio-video technologies.*
- ▶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



Encounter Taxonomy

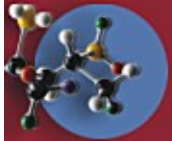
	Emergent Setting	Non-Emergent Setting
Consult (CMA at near, patient side)	Real time	Real time Store-and-forward
Provider Extension (CMA at far side)	Real time	Real time Store-and-forward

*CMA = Controlling Medical Authority



Telehealth Levels

	Level	Store-and-Forward	Real Time	Type of Data Transmitted	Minimum Bandwidth Kbit/s per Connection
Advanced Telehealth	IV	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)
		Modern Telehealth	III	Hybrid with high-resolution video and image	
II	a. High-resolution still images		b. Low-resolution video	Images, low resolution video	Low (128 kbits/s)
Pre-Telehealth	I	Email of textual information	Faxing of textual information	Electronic transmission of textual data	Modem (<10 kbits/s)
	0	Postal mail	Verbal report via telephone	Traditional, non-electronic, methods of communication	Telephone network



Telehealth Cost-Benefit Model

- ▶ 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
Baseline Transports ED to ED	2,204,320		
Pre-Telehealth Transport Cost	\$1,390,000,000		
Avoided Transports ED to ED	N/A	646,000	850,000
Annual Telehealth Savings	N/A	\$408,000,000	\$537,000,000
Annual Telehealth Costs	N/A	\$60,000,000	\$64,000,000



Savings from Avoided Transports Between Emergency Departments

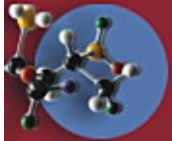
From the prospective of the healthcare system, the cost to equip all US emergency departments with telehealth technologies could easily be covered by savings from a reduction in transfers between emergency departments.

Savings from Avoided Visits from Correctional Facility to EDs

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

Savings from Avoided Visits from Correctional Facilities to MD offices

	Store-and-Forward	Real-Time Video	Hybrid
Baseline Transport CF to MD office	691,000		
Pre-Telehealth Transport & Visit Cost	\$302,000,000		
Avoided Visits from CF to ED	411,000	452,000	543,000
Annual Telehealth Savings	\$162,000,000	\$171,000,000	\$210,000,000
Annual Savings per Inmate	\$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
Baseline Transport NF to ED	2,699,000		
Pre-Telehealth Transport & Visit Cost	\$3,620,000,000		
Avoided Visits from NF to ED	N/A	34,900	39,900
Annual Telehealth Savings	N/A	\$259,000,000	\$327,000,000
Annual Savings per Resident	N/A	\$174	\$219

Savings from Avoided Visits from Nursing Facilities to MD Offices

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

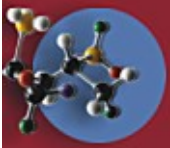


Savings from Connecting Nursing Facilities to EDs and MD Offices

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

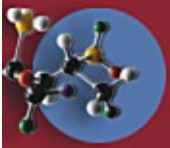
	Store-and-Forward (Level IIa)	Real-Time Video (Level IIb)	Hybrid (Level III)
Total Pre-Telehealth Costs	\$28,700,000,000		
Annual Savings from Avoided Face-to-Face Visits	\$468,000,000	(\$3,000,000,000)	(\$1,620,000,000)
Annual Savings from Avoided Redundant & Unnecessary Tests	\$2,540,000,000	\$2,290,000,000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



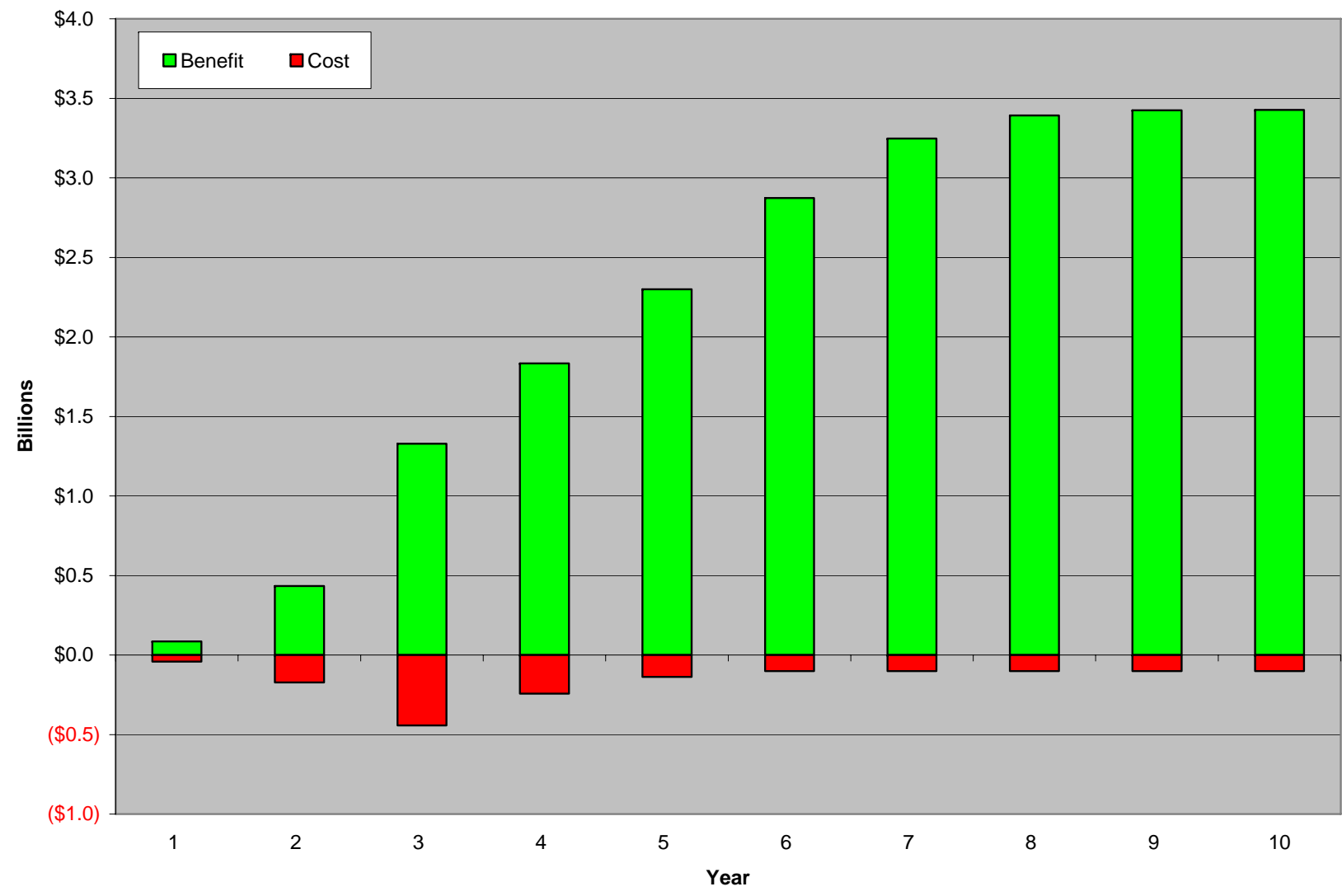


Benefit of Provider-to-Provider Tele-consultations

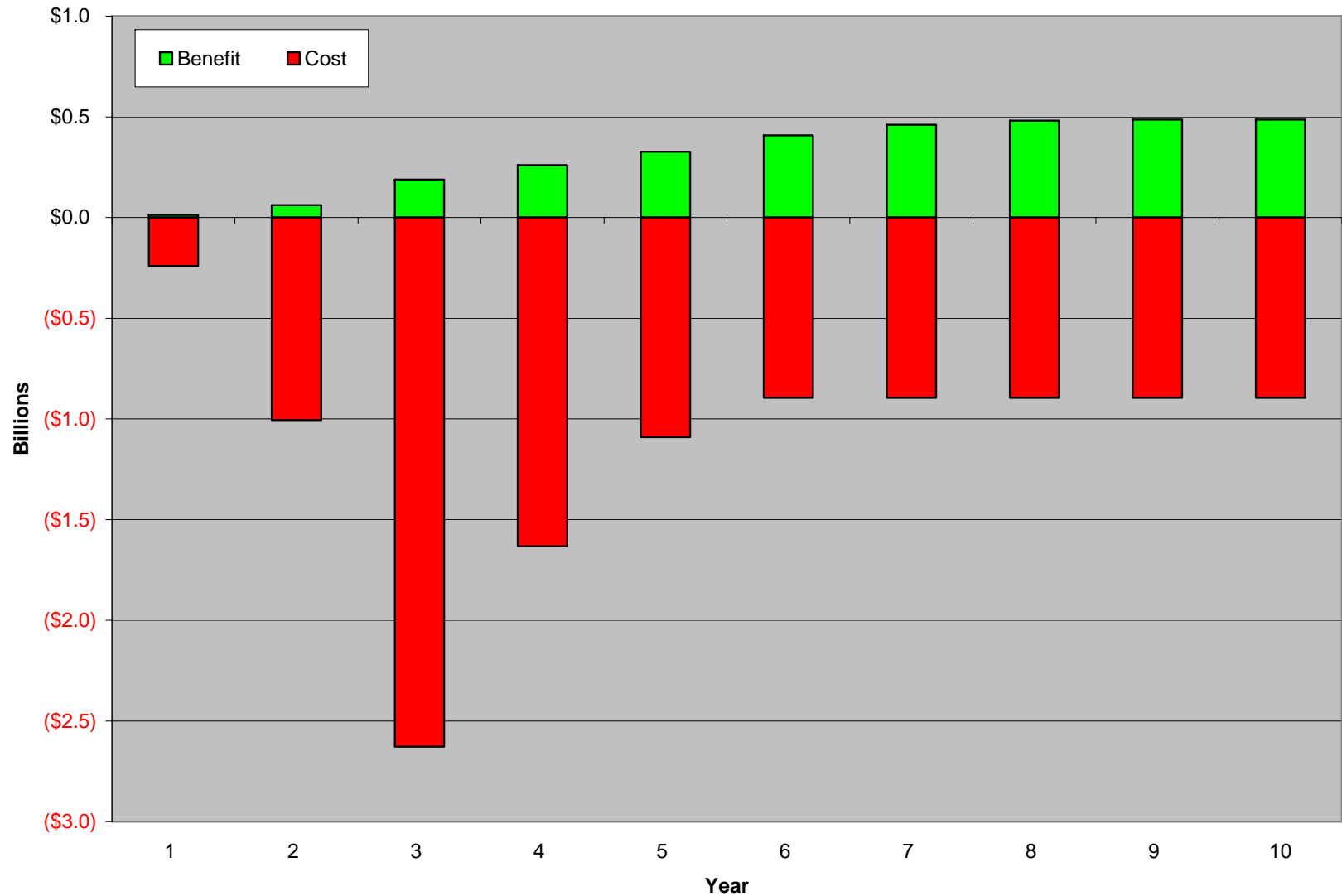
There is a loss to the system from teleconsults with real-time video and hybrid technologies when considering only professional fees. These losses could be far outweighed in the hybrid scenario by involving specialists early in the care of a patient and reducing the number of redundant or unnecessary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

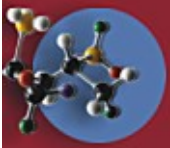


National Annual Cost-Benefit Cashflow for Store-and-Forward (IIa)

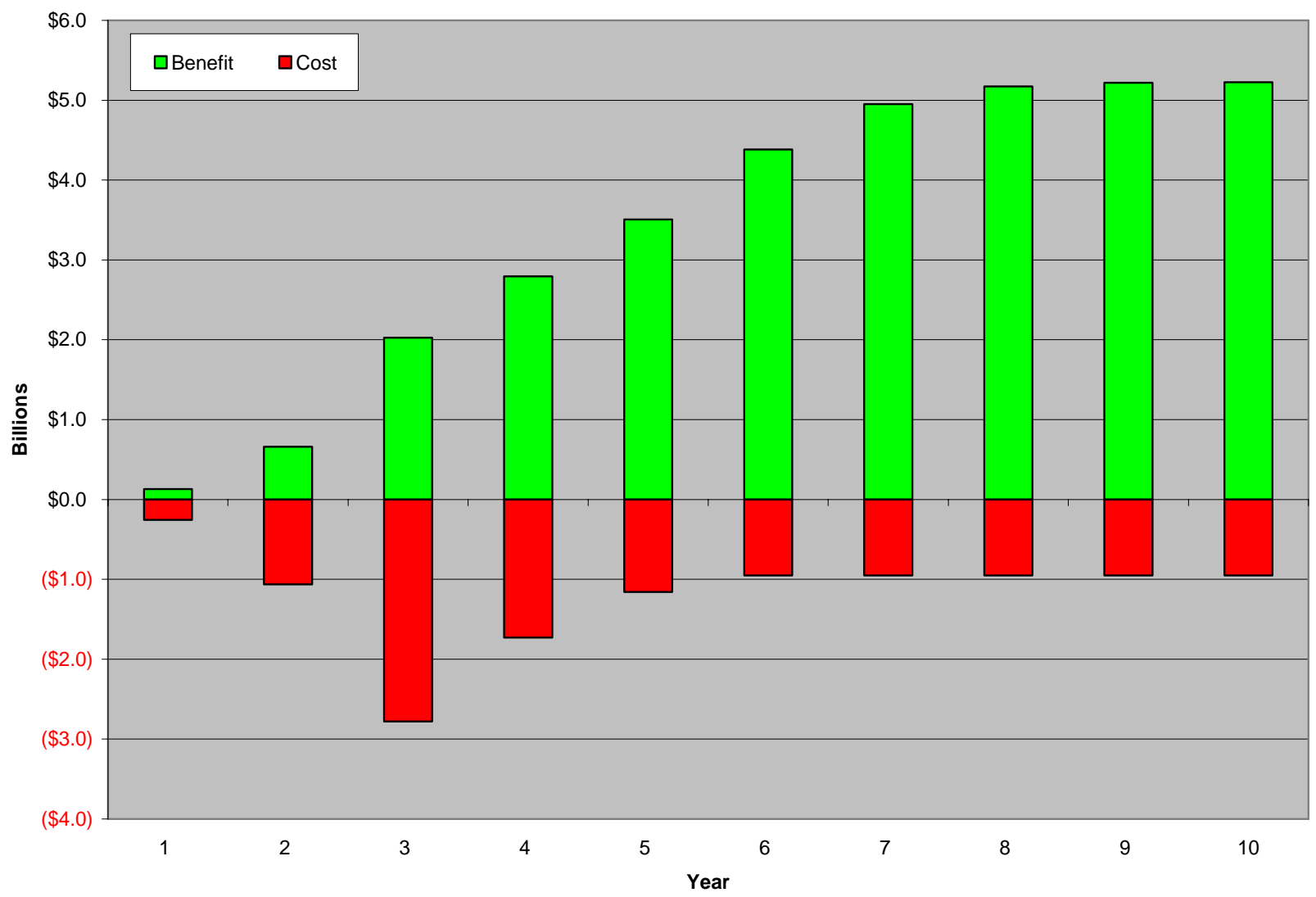


National Annual Cost-Benefit Cashflow for Real-Time video (IIb)

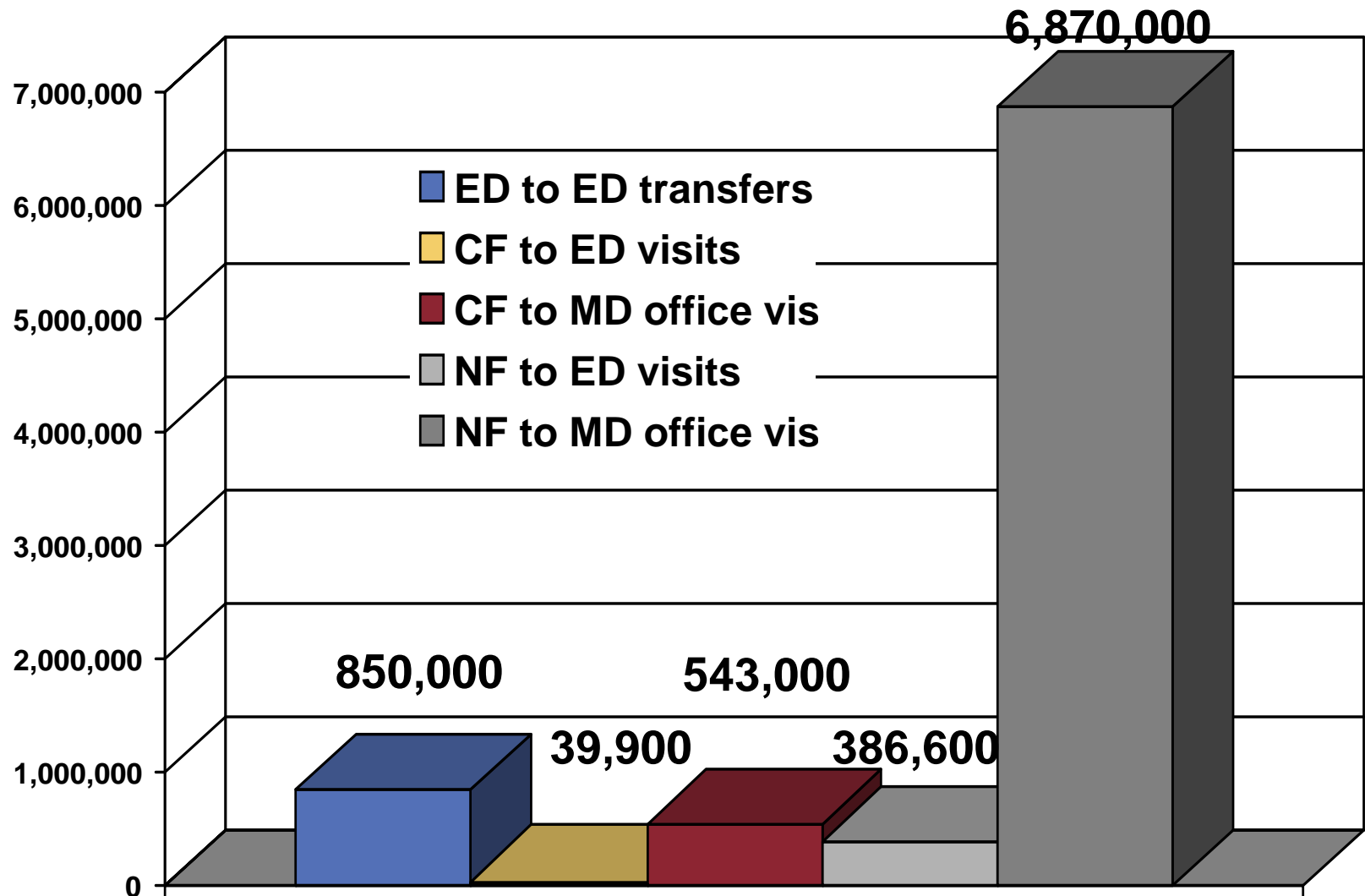




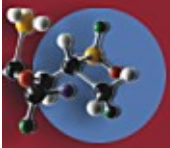
National Annual Cost-Benefit Cashflow for Hybrid (III)



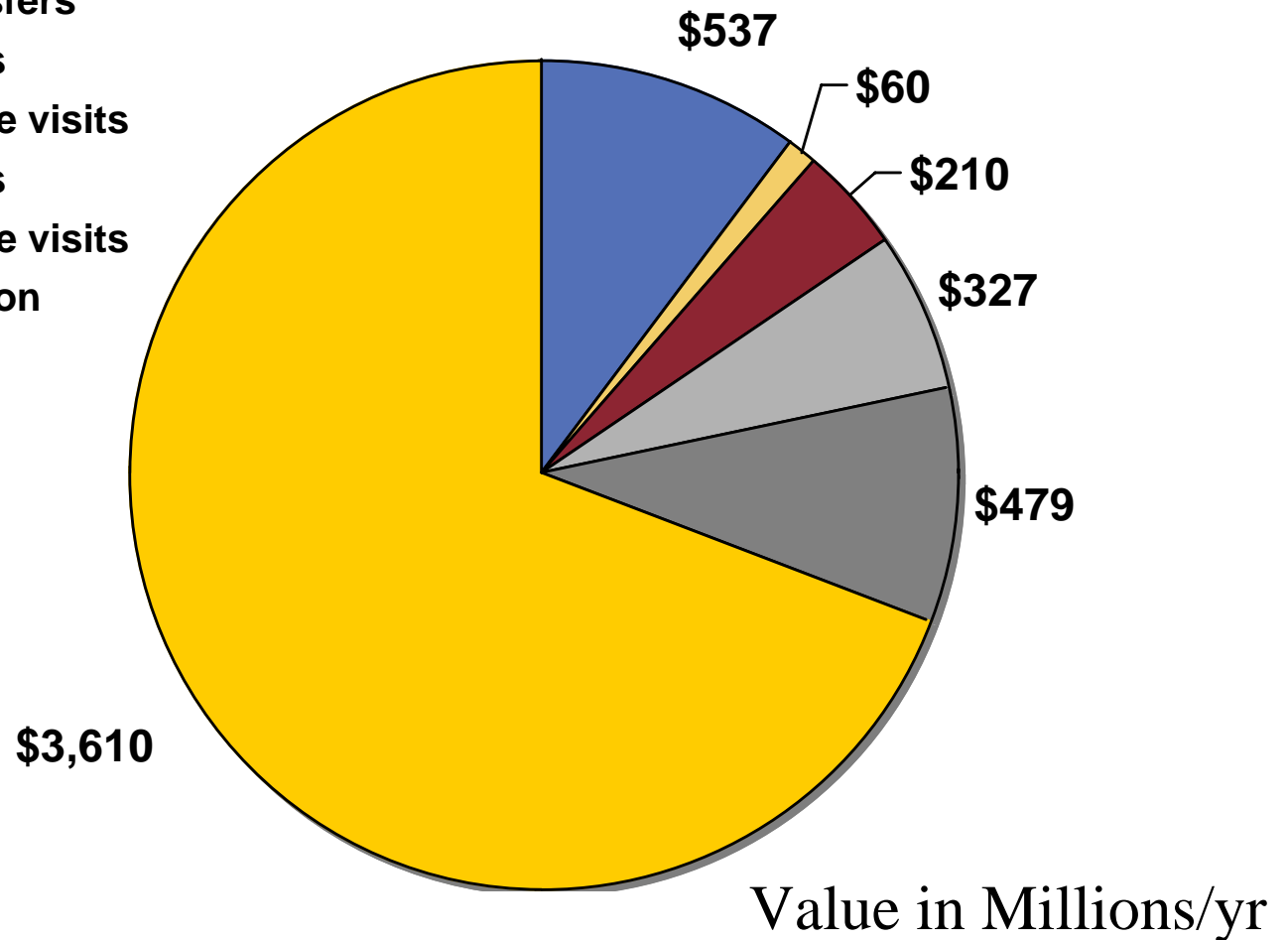
Avoided Transports in National Hybrid deployment scenario

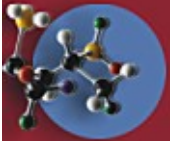


Annual Savings in National Hybrid deployment scenario

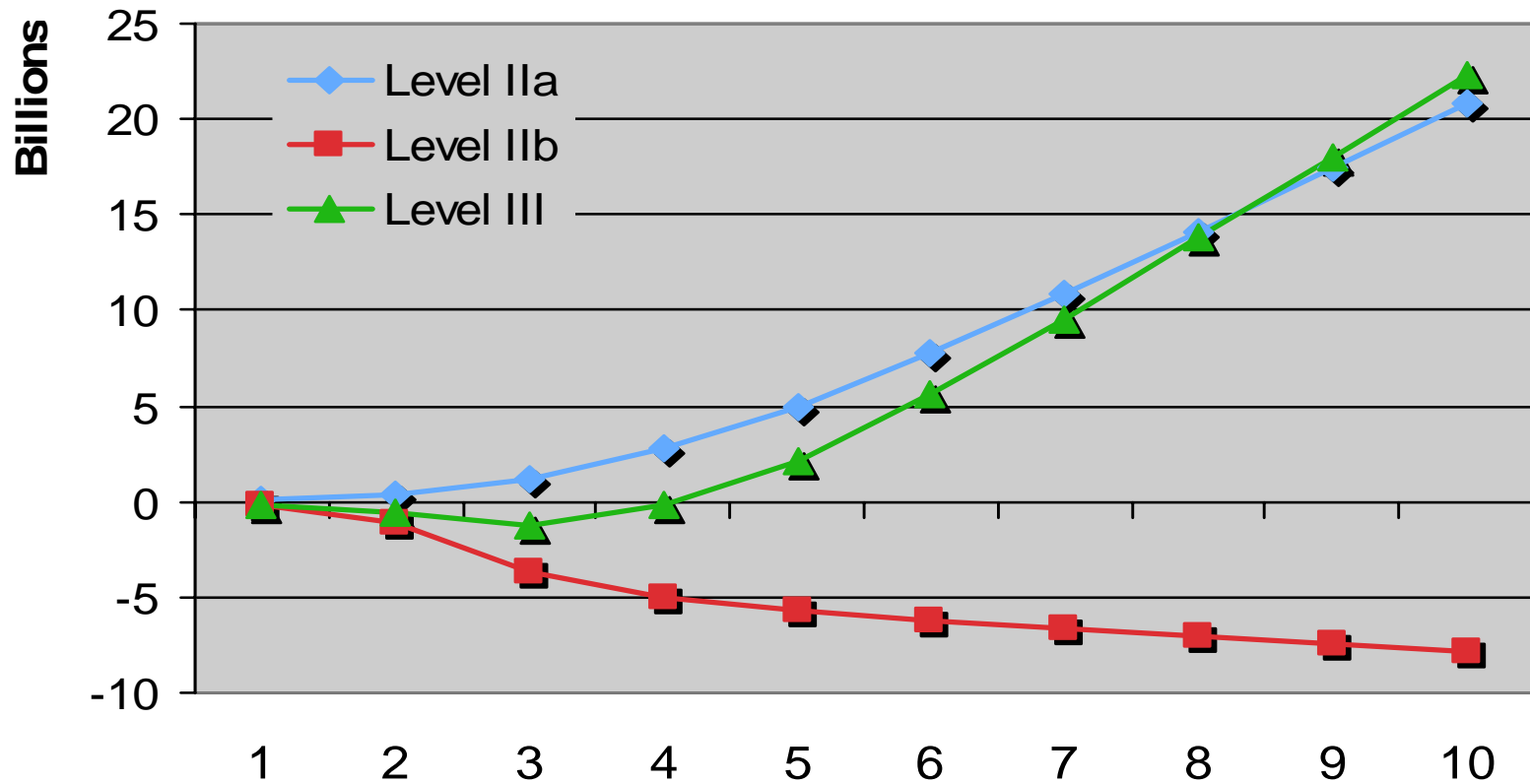


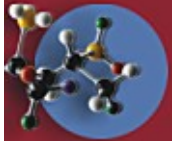
- ED to ED transfers
- CF to ED visits
- CF to MD office visits
- NF to ED visits
- NF to MD office visits
- Teleconsultation





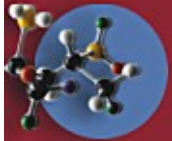
National Cumulative Net Value





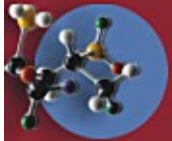
Summary of Results

- ▶ 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



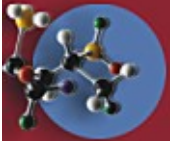
Limitations

- ▶ Modeling non-specific specialty care may have under/overestimated results
- ▶ Modeling future state where barriers do not exist may overestimate results
- ▶ Limiting analysis to provider-to-provider encounters underestimates value of complete telehealth programs



Implications

- ▶ Despite positive financial findings, barriers still exist and steps must be made to remove them
 - Current reimbursement model that favors physical, in-person visits
 - Concerns around medical liability
 - A lack of cross-state licensure



Implications

▶ Misalignment of Incentives

- Provider organizations pay for systems while payers reap benefits
- Exception – correctional facilities
- Impetus for payer organizations to share in cost of telehealth systems

Thank You!!!

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