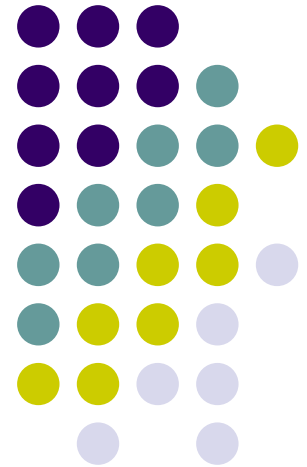
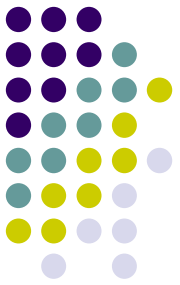


Models of Cost Savings Enabled by EHR

Blackford Middleton, MD, MPH, MSc
Chairman Center for IT Leadership
Director Clinical Informatics R&D,
Partners Healthcare
Assistant Professor of Medicine
Brigham & Women's Hospital
Harvard Medical School





Overview

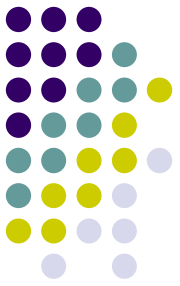
- How do EHR's produce value?
- What do ROI analyses suggest?
- What are California State level effects?
- What is potential National Impact?

EMR Impact on Clinical Outcomes, Utilization, Process



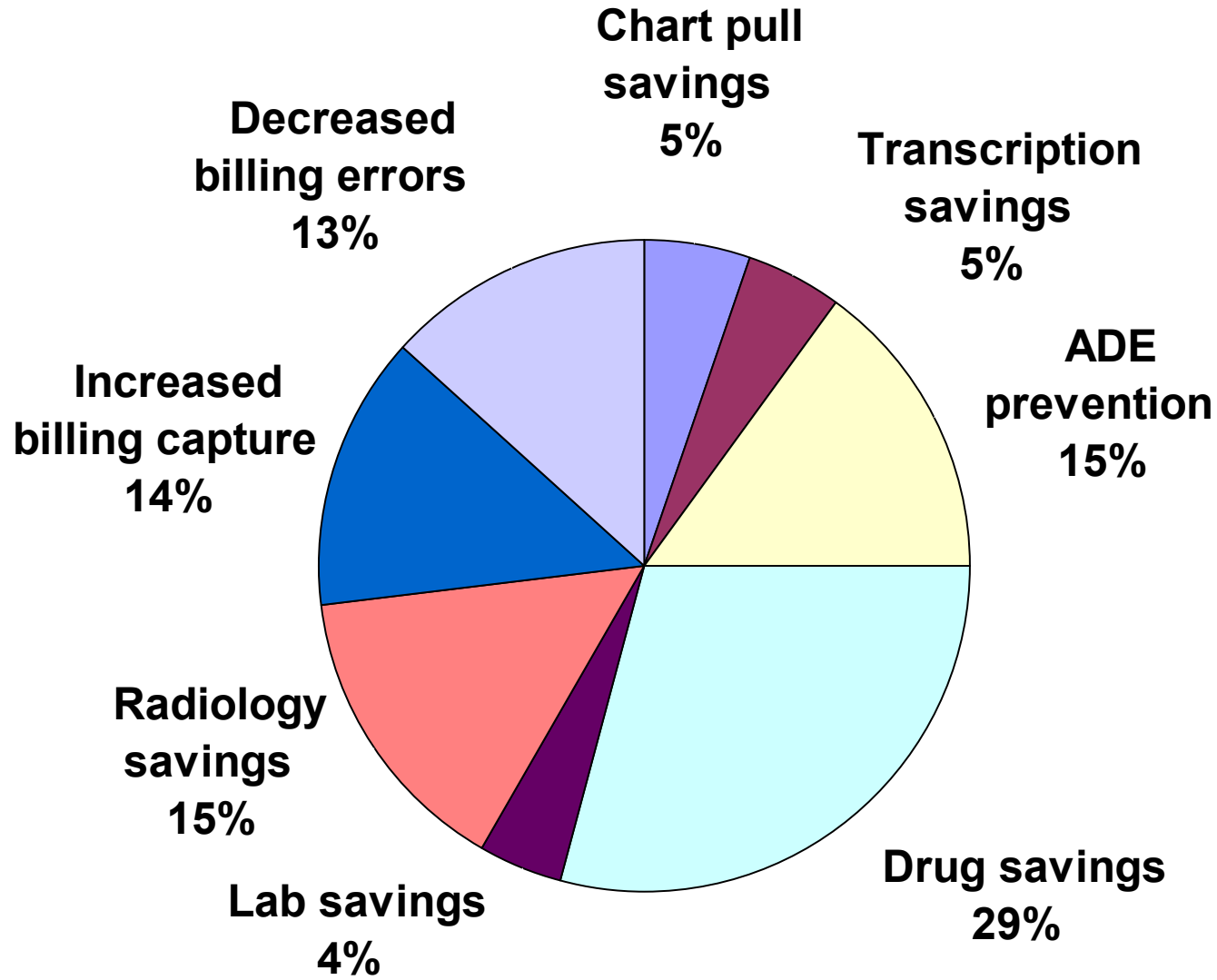
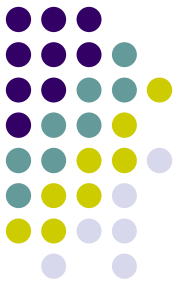
- Streamline, structure order process
- Ensure completeness, correctness
- Perform drug interaction checks
- Supply patient data
- Calculate and adjust doses based upon age, weight, renal function
- Suggest brand to generic substitutions
- Charge display
- Redundant test reminders
- Structured ordering with counter-detailing
- Consequent or corollary orders
- Reduced transcription costs
- Reduced chart pulls
- Improved clinical messaging and workflow
- Improved charge capture and accounts receivable
- Improved referral coordination
- Improved patient communication and service

Partners LMR Cost-Benefit Model

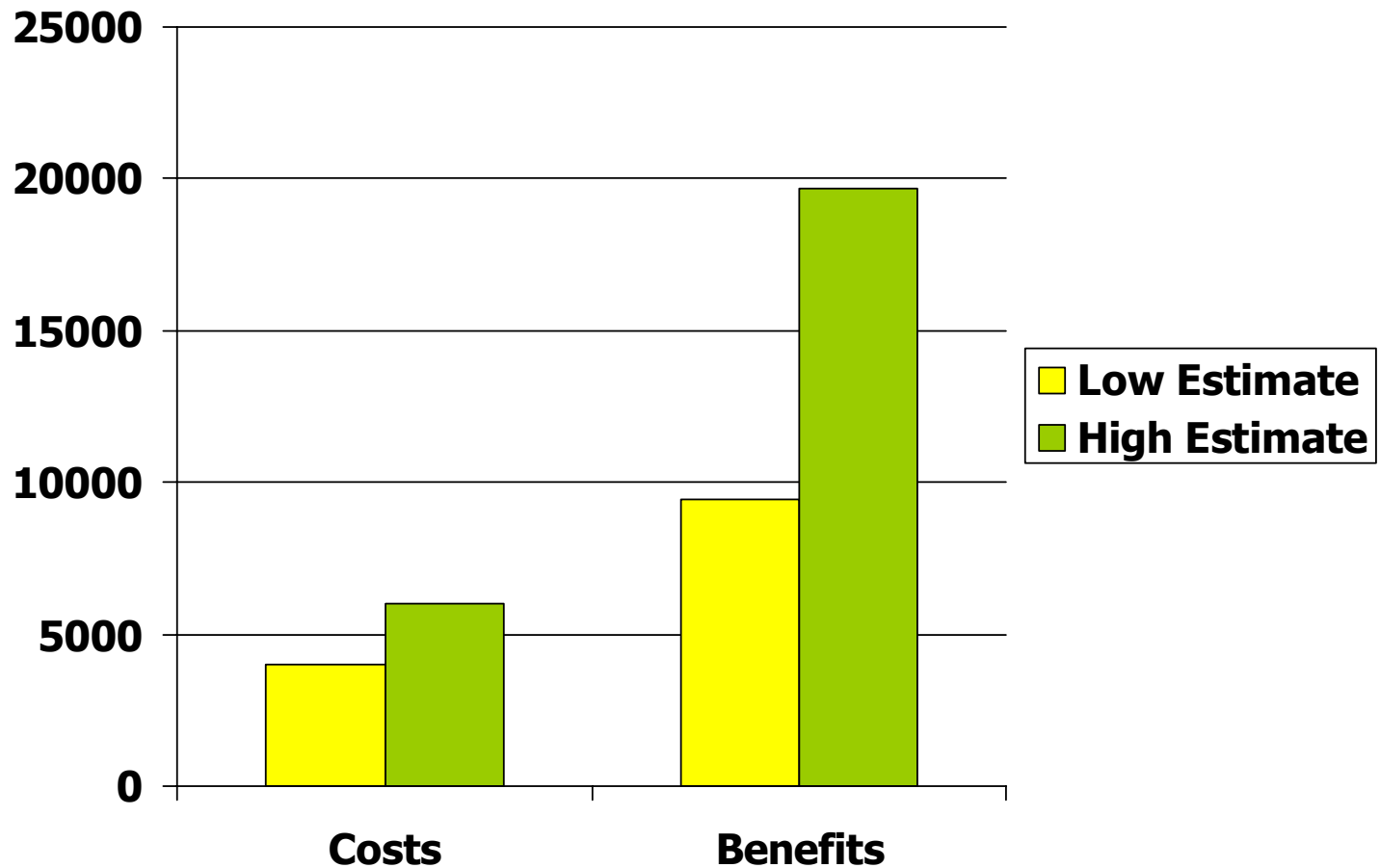
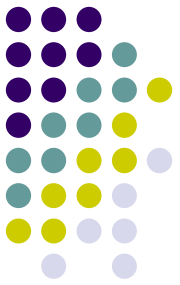


- Created a “typical” patient panel for a PCP
- Created a model using base case assumptions
- Analyze costs & savings
- All cost and benefit figures are per PCP per year
- Performed 1-way sensitivity analyses

LMR Benefits at Partners

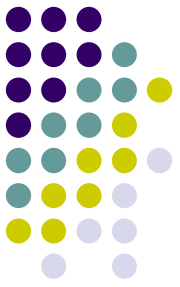


Costs of LMR vs. Benefits

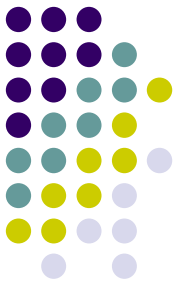


Present Value of Costs vs. Benefits over 5 Years

ACPOE System Classification



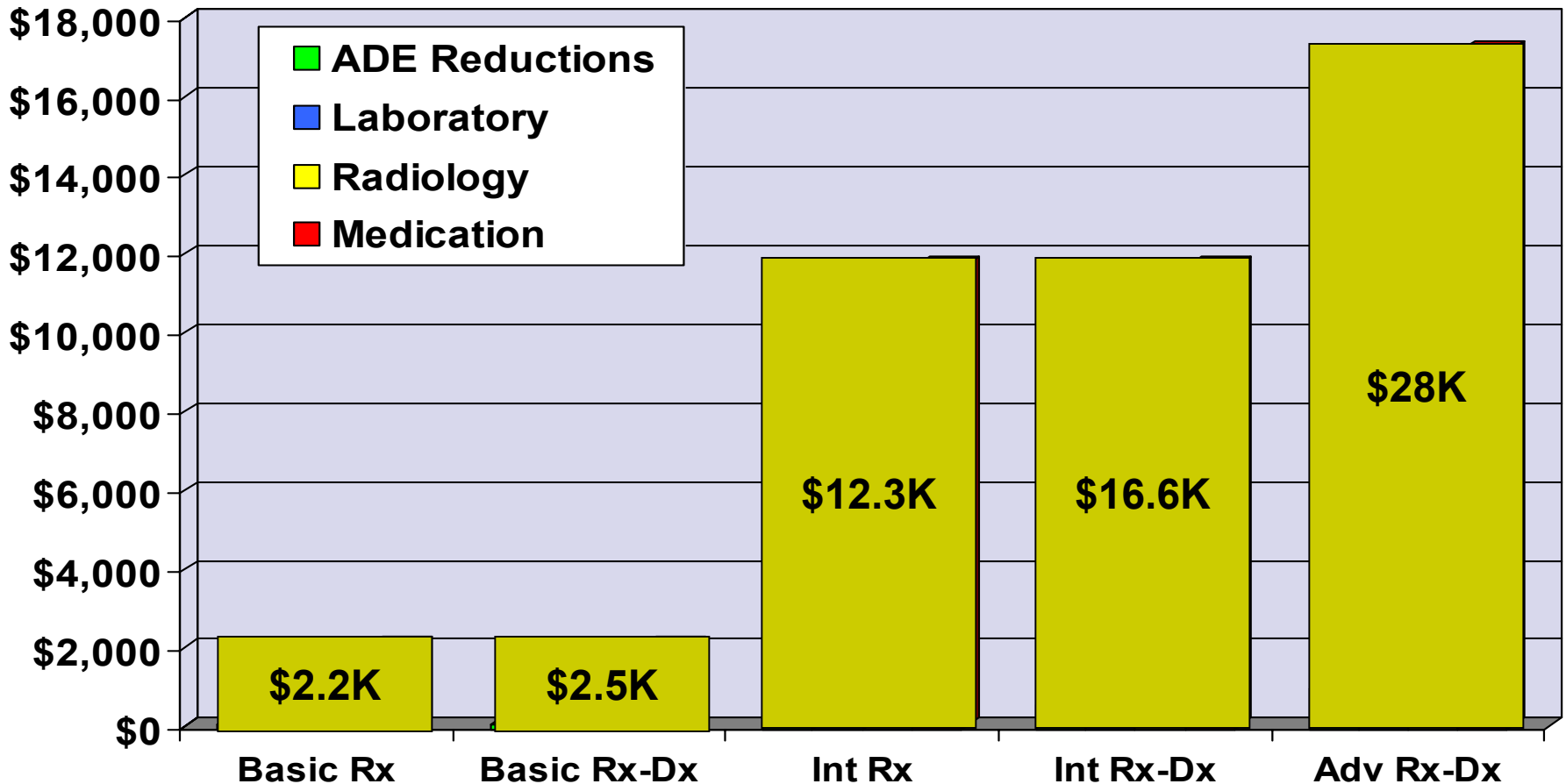
Class	Medication (Rx) OE	Diagnostic (Dx) OE
1: Basic Rx-only	Structuring data capture, passive references	
2: Basic Rx-Dx		
3: Intermediate Rx-only	Rx & Order-specific decision support, with some patient data	
4: Intermediate Rx-Dx		
5: Advanced Rx-Dx	Sophisticated Rx & Order-specific decision support, with most patient data, EDI	



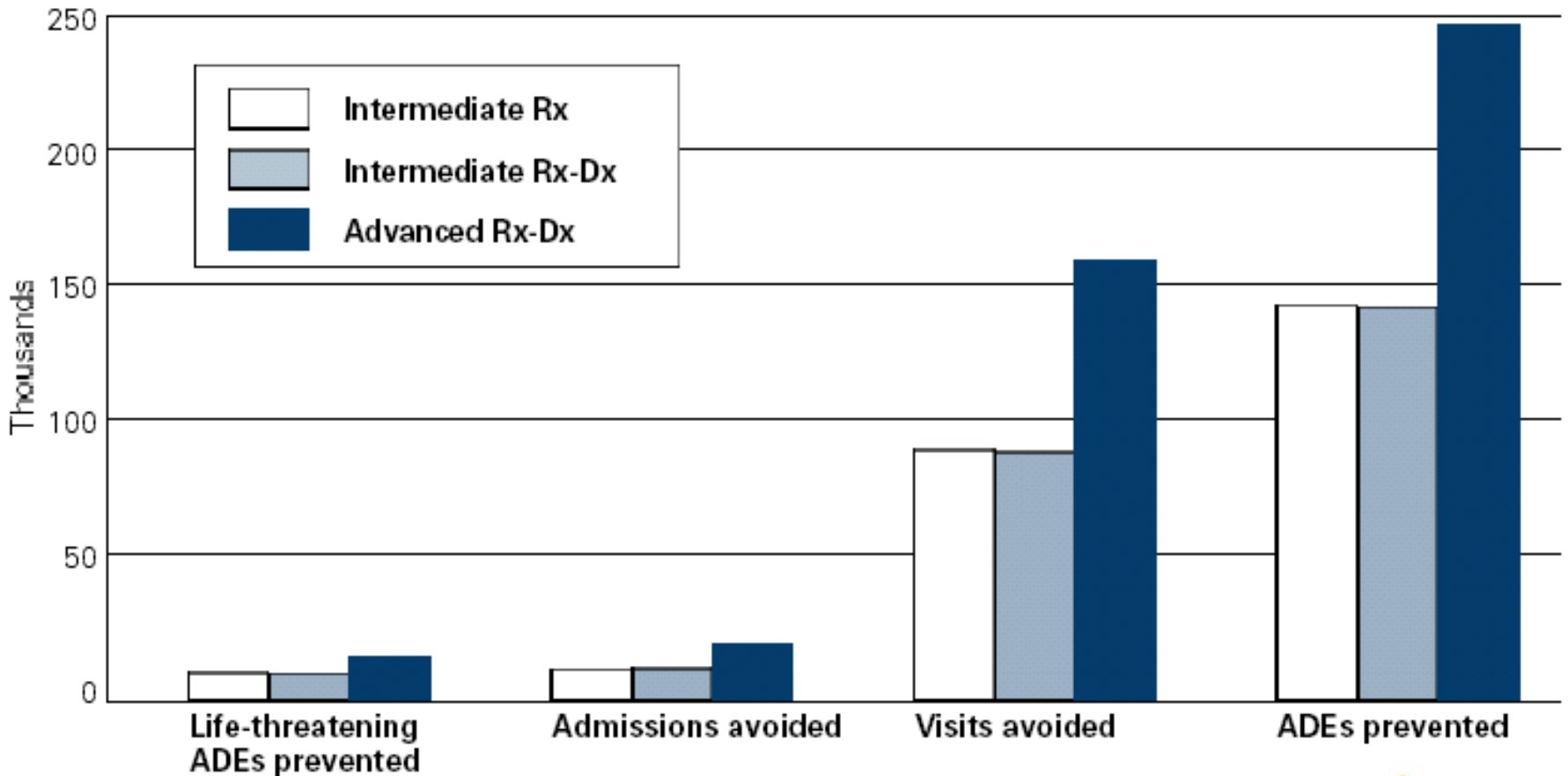
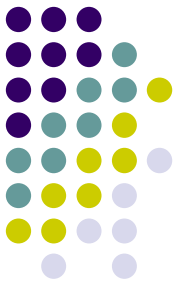
Clinical Impact of ACPOE

- Per “average” provider, Advanced ACPOE systems would prevent...
 - 9 ADE/yr
 - 6 ADE visit/yr
 - 4 ADE admission/5yr
 - 3 life-threatening ADE/5yr

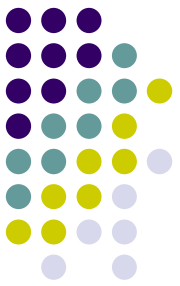
Per “Average” Provider Annual Cost Saving Projections



Annual Impact of ACPOE on ADE Prevention in California

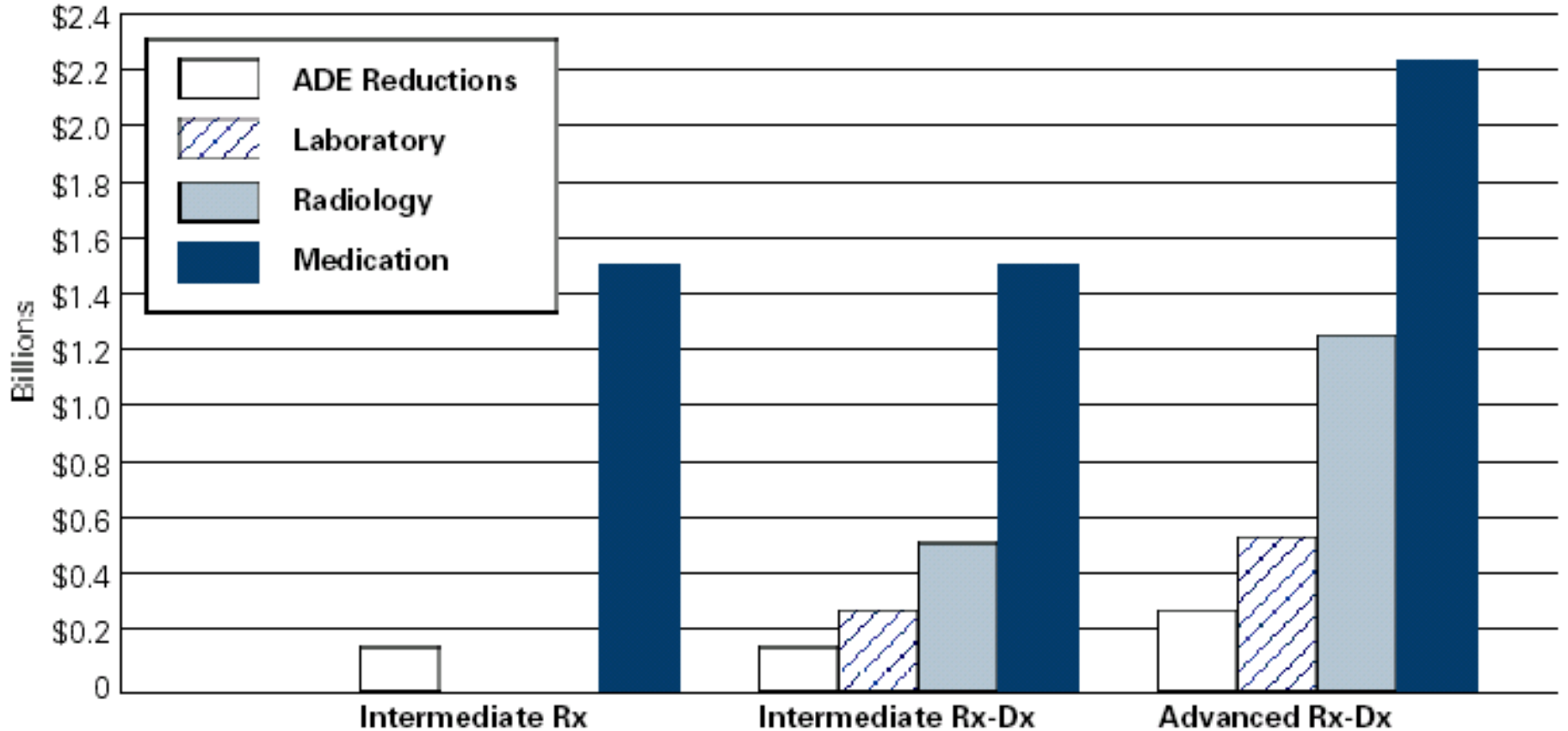
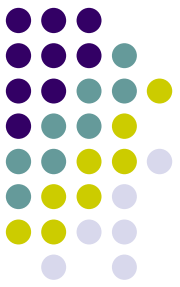


ACPOE System Costs per Provider, Self Financing

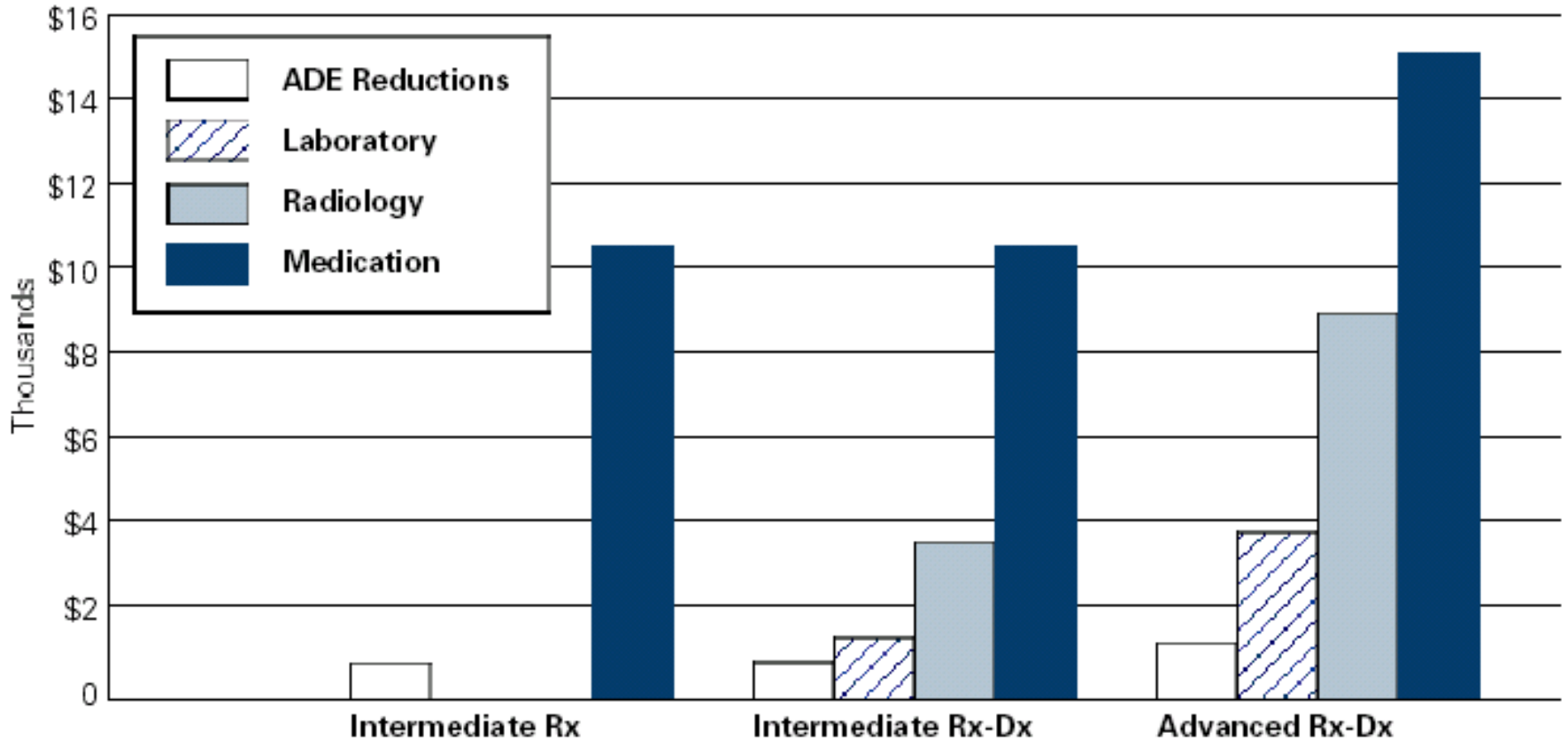
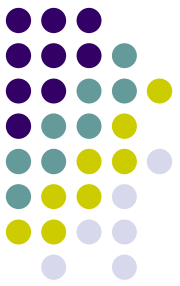


	Intermediate Rx	Intermediate Rx-Dx	Advanced Rx-Dx
1 Provider			
Year 1 costs	\$13,130	\$32,170	\$377,600
Year 2-5 costs (per annum)	\$4,266	\$6,625	\$31,950
Total 5 year costs	\$30,194	\$58,670	\$505,400
5 Providers			
Year 1 costs	\$7,599	\$19,220	\$87,350
Year 2-5 costs (per annum)	\$2,732	\$4,105	\$8,652
Total 5 year costs	\$18,527	\$35,640	\$121,958
10 Providers			
Year 1 costs	\$6,907	\$17,600	\$51,070
Year 2-5 costs (per annum)	\$2,540	\$3,790	\$5,739
Total 5 year costs	\$17,067	\$32,760	\$74,026
25 Providers			
Year 1 costs	\$6,492	\$16,630	\$29,300
Year 2-5 costs (per annum)	\$2,425	\$3,601	\$3,991
Total 5 year costs	\$16,192	\$31,034	\$45,264
50 Providers			
Year 1 costs	\$6,354	\$16,310	\$22,040
Year 2-5 costs (per annum)	\$2,387	\$3,538	\$3,409
Total 5 year costs	\$15,902	\$30,462	\$35,676

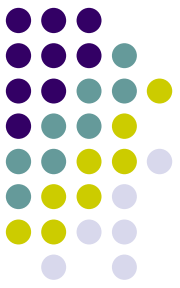
Annual ACPOE Cost Savings, California



Annual ACPOE Cost Savings per Outpatient Provider in California

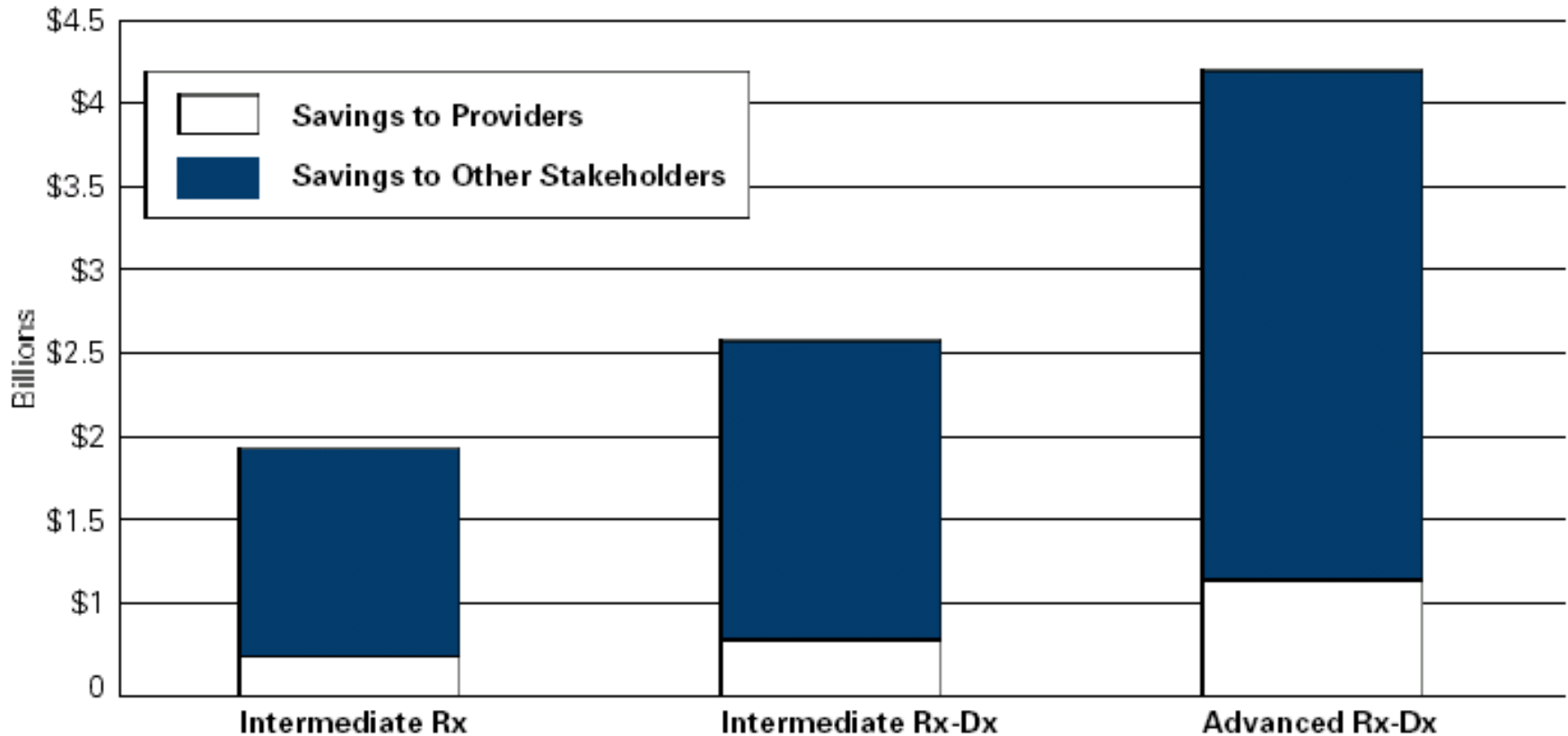
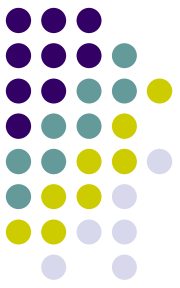


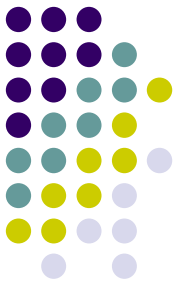
Five-Year Net Return per Provider at 14.4 Percent Capitation



	Intermediate Rx	Intermediate Rx-Dx	Advanced Rx-Dx
1 Provider	\$25,240	\$24,040	(\$362,800)
5 Providers	\$36,910	\$47,060	\$21,600
10 Providers	\$38,370	\$49,940	\$69,650
25 Providers	\$39,240	\$51,670	\$98,480
50 Providers	\$39,530	\$52,240	\$108,100

California Annual ACPOE Savings for Providers and Other Health Care Stakeholders





For More Information

- See www.citl.org
- Wang S, Middleton B, Prosser L, et al. A Cost-Benefit Analysis for Electronic Medical Record Systems in Primary Care. *Am J Med* 2003
- CITL Value of ACPOE Full Report
 - Available from www.CITL.org and www.HIMSS.org
- Patient Safety In the Physician's Office: Assessing the Value of Ambulatory CPOE
 - CHCF <http://www.chcf.org/topics/view.cfm?itemID=101965>

“I conclude that though the individual physician is not perfectible, the system of care is, and that the computer will play a major part in the perfection of future care systems.”

***Clem McDonald, MD
NEJM 295:1355, 1976***

Thank you!

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bmiddleton1@partners.org

