Economic Challenges in Hematopoietic Cell Transplantation: How will new and old centers face the future?

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Disclosures

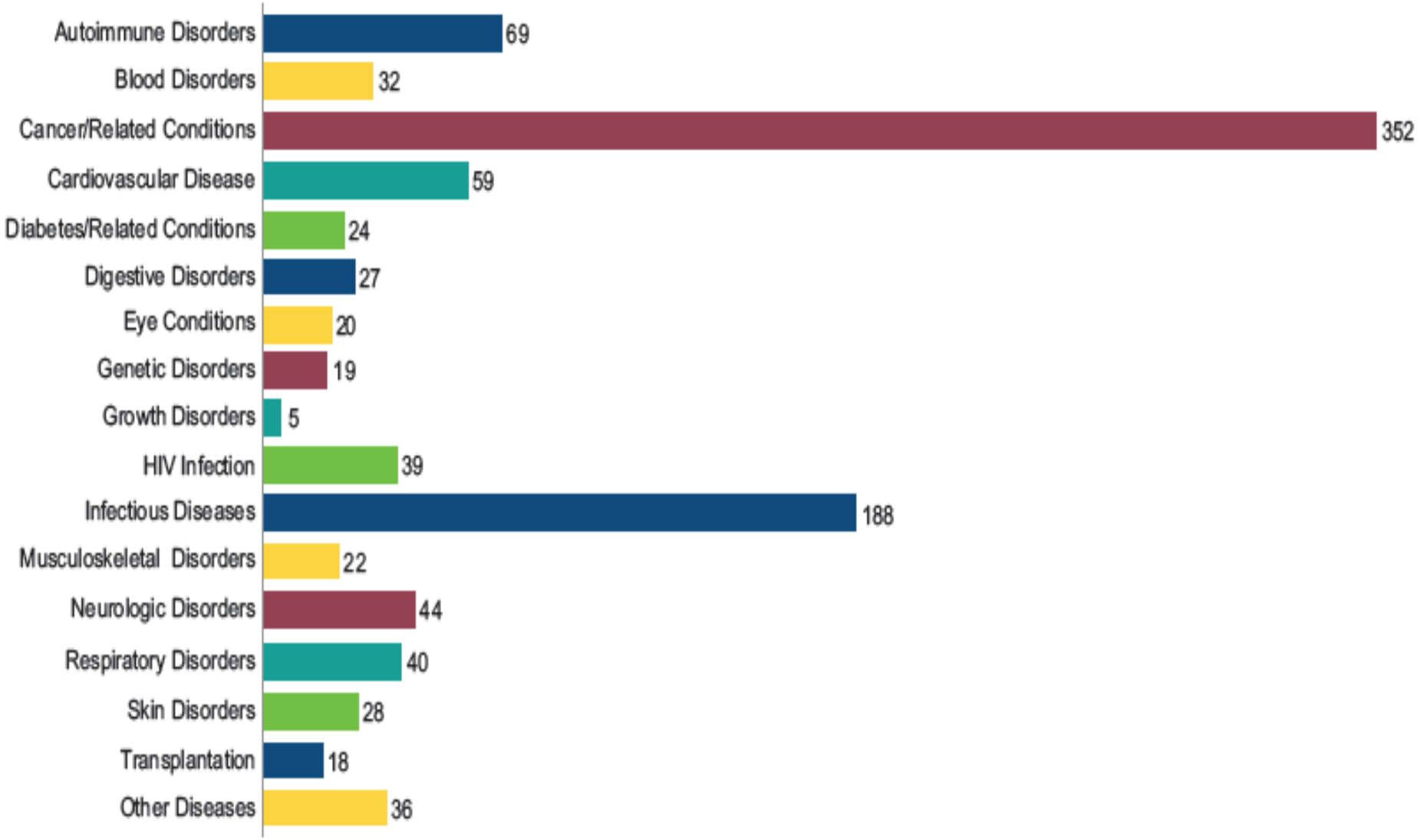
None pertinent to this topic

Recent industry relationships

Consultant: Alexion, Amgen, Kadmon, Enlivex

Research support: Alexion

Biotechnology Medicines in Development—by Therapeutic Category



Today we are not discussing

- New high cost drugs, biologicals
- Lots of editorials and attention

- Back to basics of cost-appropriate care

Needs Analysis—> How many HCTs?

Using the optimal transplant rate for the population:

The US **needs** allogeneic (related and unrelated) HCT ~**18,000/ yr**.

Related – 5,500/ yr

Unrelated – 12,500/ yr

Recent HCT in US only:

2015 = ~8,000/ yr shortage of ~10,000

2005 = ~2,500/ yr

Need Gap is Larger in many parts of the world

Attributed to NMDP health resource group

Table 1. Commonly performed procedures with the most rapidly increasing hospital inpatient costs, 2004–2007

Principal procedure category	Total costs (2007)	Total hospital stays (2007)	Percentage change	
			Total costs (2004–2007)	Total hospital stays (2004–2007)
Bone marrow transplant	$1,282,645,000	15,100	84.9%	51.3%
Open prostatectomy	$1,032,016,000	88,500	68.6%	40.8%
Aortic resection; r… anastomosis				31.9%
Cancer chemother…				14.2%
Spinal fusion				15.6%
Lobectomy or pneu…				24.9%
Incision and draina… subcutaneous tissu…				31.5%
Arthroplasty knee	$9,217,740,000	605,200	27.5%	25.7%
Nephrotomy and nephrostomy	$682,609,000	38,600	25.3%	11.7%
Mastectomy	$660,173,000	70,100	23.8%	3.6%
Total for top 10 procedures**	**$29,094,452,000**	**1,657,100**	**32.3%**	**22.2%**

*2004 costs were adjusted to 2007 dollars using the overall Consumer Price Index.
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2004 and 2007.

Rapid increases in costs

BMT $1.2 billion (2007)

85% increase in costs 2004-2007

51% increase in hospital stays 2004-2007

Financial Challenges in HCT

HCT- big expense (billions)

Outcomes - unsuccessful for 40-60% of people

→How many billions of $ can be retargeted for alternate use --- or

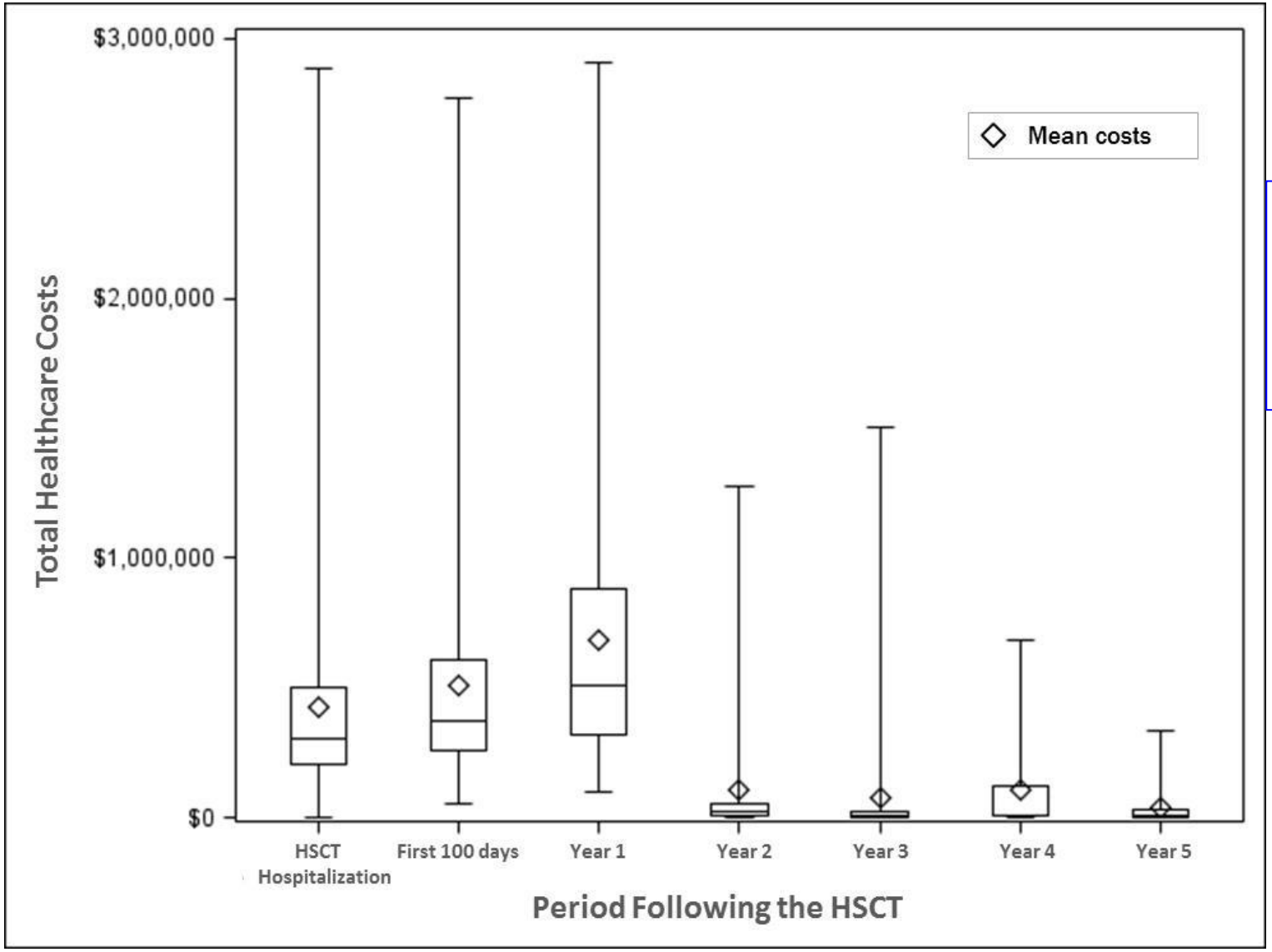
→How must we save per HCT?

Costs during first 100 days

	Auto	Allo	
N	1678	1320	more visits
Hospital stay in days, median	19	31	+12
Outpatient clinic visits, median	12	22	+10
Total costs, median	$99,899	$203,026	~$50K post discharge
1st hospitalization costs, median	$82,606	$151,899	
Later hospital costs, median	$0	$0	
Outpatient costs, median	$7,462	$20,767	

Majhail, BMT 2013

Distribution of Total Healthcare Costs

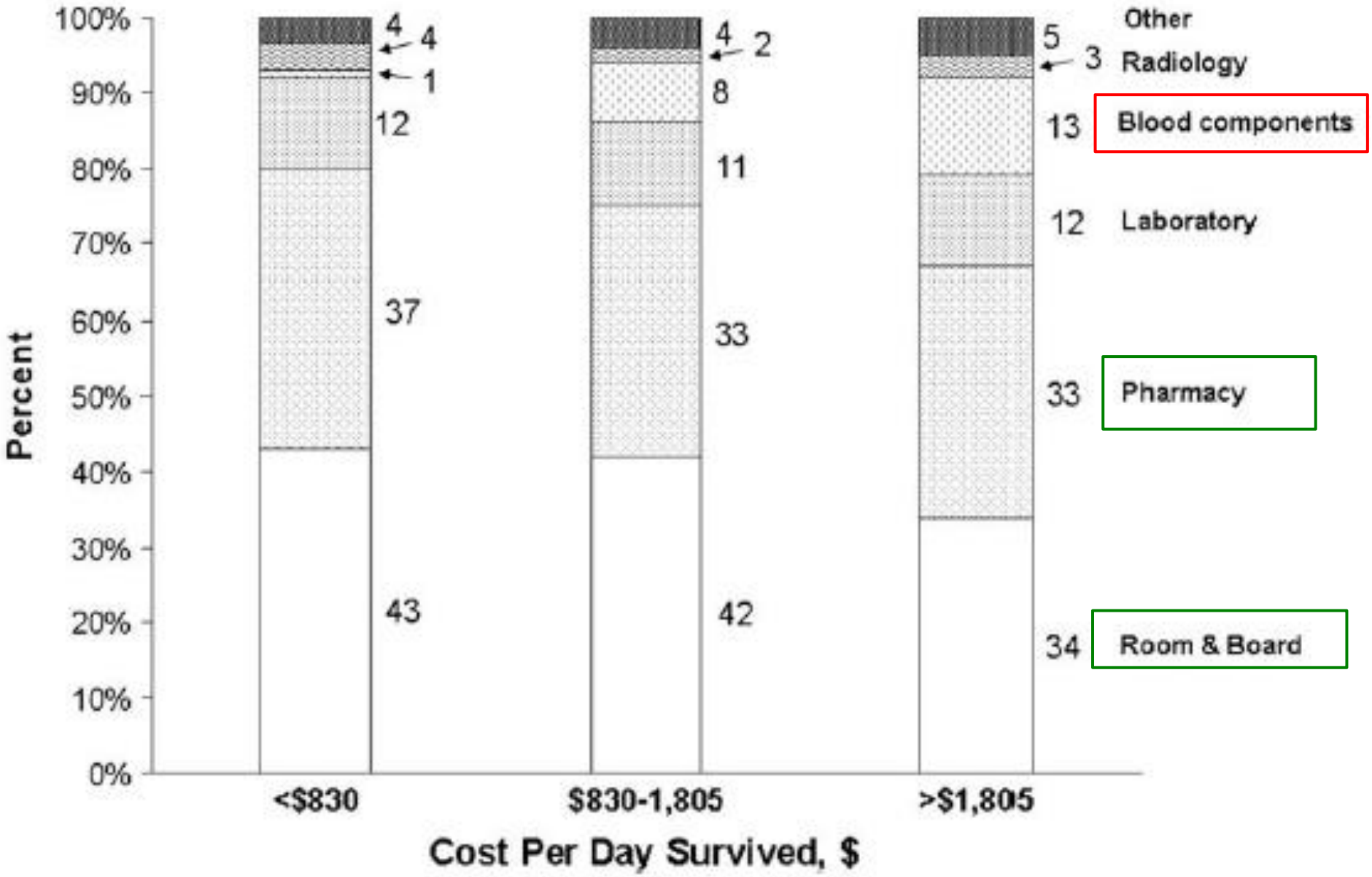


29% of costs for 10% of pts

High variation in costs between individual patients

Maziarz, ASH, 2015

Allogeneic HCT Costs



Majhail, BBMT, 2009

How can we limit the costs of HCT?

What interventions are worth it? In whom and how often?

Research Costs of HCT tests —> *Retail 5x higher*.

- CMV DNA PCR $60 *weekly thru d 100* *$3600*
  longer if GVHD?

What new interventions are worth it? In whom and how often?

Research Costs of HCT tests —> *Retail 5x higher*.

- CMV DNA PCR $60 *weekly thru d 100* *$3600*
  longer if GVHD?

- HHV6 DNA PCR $69 *weekly thru d 100* *$4140*
  Only UCB?
- EBV DNA PCR $63 biweekly thru d100 $1890
  Only if ATG, mismatched or T cell depleted

What is the value added?

Neutropenic; Fever; Ill-appearing

	Research costs (x3 for retail)
Chest xray	$75 = $225
CT scan Chest	$530 = $1590

What is the value added?

Neutropenic; Fever; Ill-appearing

	Research costs (x3)
Chest xray	$75 = $225

Does a normal CXR eliminate the CT?

If CXR abnormal, then CT follows anyway

CT scan	Chest	$530 = $1590

What is the value added?

Restaging NHL/HL post HCT

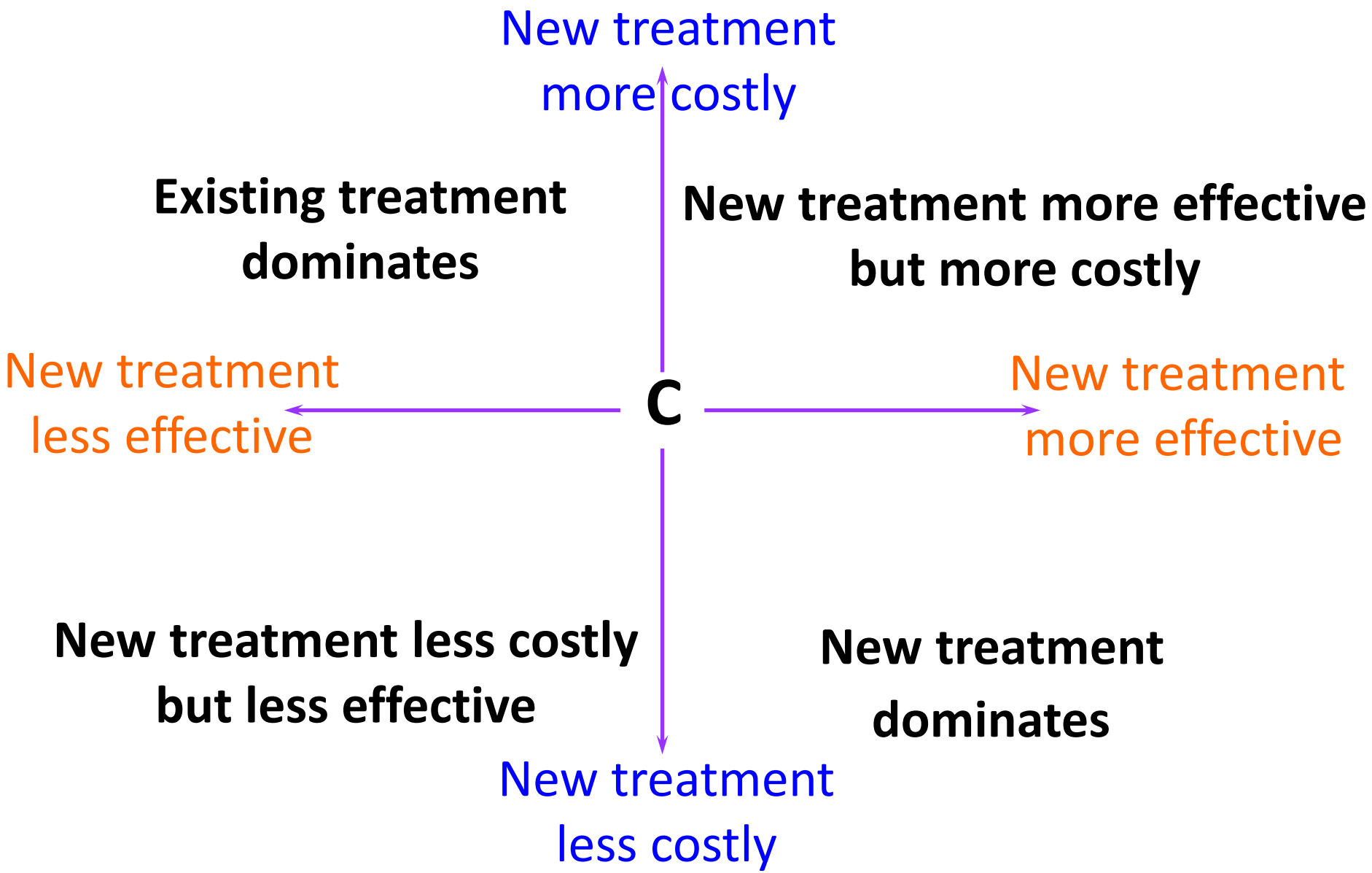
		Research costs (x3)
CT scan	Chest abd pelvis	$530 (x 3 = $1590)
PET CT scan	Chest abd pelvis	$2050 (x 3 = $6050)

pre-HCT; d100, 6,9,12,18,24 months = 7 scans

$11,130 vs. $42350

When is PET informative? and for whom? Stop at 24m?

THE COST-EFFECTIVENESS PLANE



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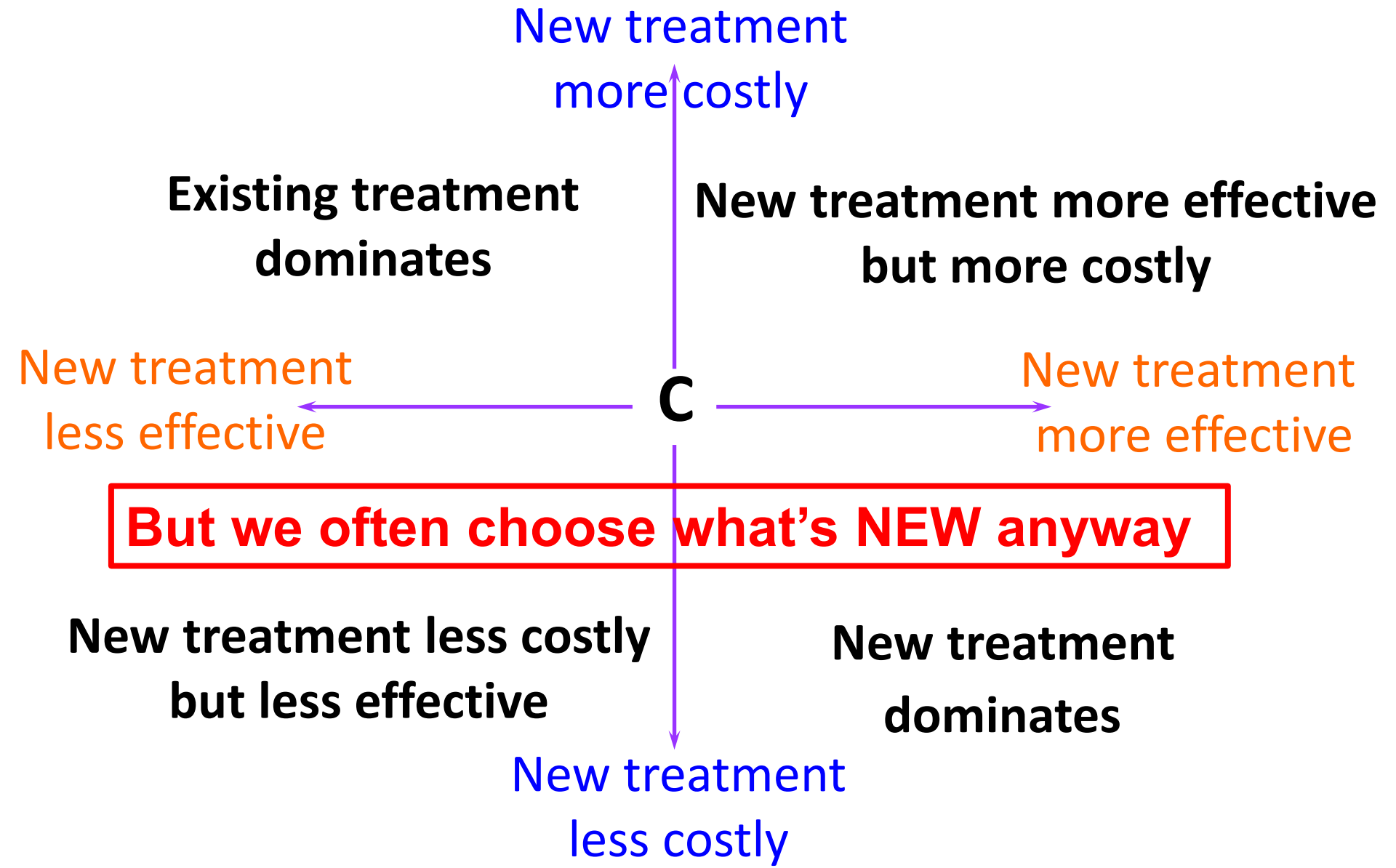

Cost Effectiveness of HCT—limitations of the data

Long term costs

- Chronic GVHD; Late effects

Patient financial burden

- Out of pocket
- Lost wages
- Housing away from home
- Disability before returning to work or school

New techniques, New drugs

Expenses for relapse – *or its prevention*

Adapted from Khera, Blood 2012

How to Choose wisely

We must study more aspects of the topic

New Drugs; Biologics; Cell therapies

New advances are from Star Wars science

But the costs may be out of this world