OPTUM

Quality Issues in Stem Cell Transplantation from the Payer's Perspective

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I have no financial relationship(s) within the last 12 months relevant to my presentation.

My presentation does not include discussion of off-label or investigational use

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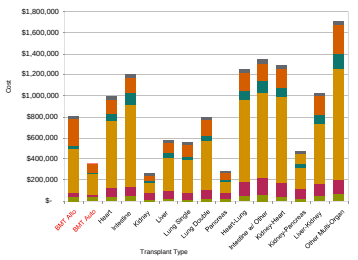
Transplant Costs are Significant

U.S. average billed charges for 180 days post-transplant is $471,857

Estimated 2011 U.S. Average First Year Billed Charges Per Transplant



On average, 65% of a transplant's total cost equals the hospital and the physician

15–20% of ALL patient events are transplant related and cost more than $100,000

- Outpatient Immunosuppressants and other RX
- 180 days post transplant admission
- Physician during transplant
- Hospital transplant admission
- Procurement
- 30 days pre-transplant

Milliman estimated U.S. average billed charges related to 30 days prior and 180 days after transplant for the commercial population under age 65

Transplant Costs – Milliman Estimates

Milliman Estimated U.S. Average 2011 Billed Charges Per Transplant

	Phase 1 30-days pre transplant	Phase 2 Procurement	Phase 3 Hospital	Phase 3 Physician	Phase 4 180 days post transplant	Phase 5 Immuno-suppressants	2011 estimated average cost	2011 estimated volume
BMT-Allo	**$41,400**	**$38,900**	**$ 419,600**	**$22,400**	**$259,800**	**23,300**	**$805.400**	**6,894**
BMT-Auto	**$44,600**	**$18,200**	**$198,200**	**$10,800**	**$84,900**	**$7,100**	**$363,800**	**13,263**
Heart	$47,200	$80,400	$634,300	$67,700	$137,800	$30,300	$997,700	2,161
Heart-Lung	$56,800	$130,500	$777,700	$81,000	$169,100	$33,300	$1,248,400	30
Intestine	$55,100	$78,500	$787,900	$104,100	$146,600	$34,600	$1,206,800	74
Intestine, other organs	$57,900	$172,700	$795,900	$116,300	$160,900	$39,500	$1,343,200	151
Kidney	$17,000	$67,200	$91,200	$18,500	$50,800	$18,200	$262,900	16,571
Kidney-Heart	$48,800	$123,600	$813,000	$93,900	$184,800	$32,400	$1,296,500	66
Kidney-Pancreas	$20,800	$102,500	$194,900	$34,700	$100,400	$21,400	$474,700	867
Liver	$25,400	$71,000	$316,900	$46,600	$93,900	$23,300	$577,100	5,898
Liver-Kidney	$46,800	$117,500	$574,100	$83,100	$180,100	$24,400	$1,026,00	369
Lung-double	$21,400	$90,300	$458,500	$56,300	$142,600	$28,200	$797,300	1,050
Lung-single	$10,300	$73,100	$302,900	$33,500	$117,700	$23,700	$561,200	734
Other multi-organ	$75,400	$131,000	$1,050,100	$139,500	$278,600	$32,900	$1,707,500	42
Pancreas	$17,00	$65,000	$108,900	$17,800	$61,400	$19,300	$289,400	286
Average	**$39,060**	**$90,693**	**$501,607**	**$61,747**	**$144,627**	**$26,127**	**$863,860**	**48,455**
Average %	**4.5%**	**10.5%**	**58.1%**	**7.1%**	**16.7%**	**3.0%**	**100%**	

15.6 transplant per 100,000 lives | $471,857 in average billed charges per transplant episode
$7.4 million in billed charges per 100,000 lives | All ages

Transplant Types and Incidences are Unique

- A 100,000 life group can expect $7.4M in billed transplant charges based on 2011 Milliman estimates of national incidence

Organ Type	Incidence
Bone Marrow	6.46
Kidney	5.30
Liver	1.98
Heart	.68
Lung (Singles and Double)	.50
Pancreas	.11
Multi-Organ/Other	.57
Total Transplants	**15.6**
Wt Avg Billed Per Transplant	**$ 471,857**
Total Exposure/100k Lives	**$7,360,969**

Milliman Weighted Average Estimated Billed Charges Per Transplant

Year	Weighted Average Cost	% Increase	Incidence
2002	$250,178		16.2
2005	$297,736	19.0%	15.8
2006	$330,710	11.1%	16.1
2007	$380,760	15.1%	15.8
2008	$426,624	12.0%	16.4
2011	$471,857	10.6%	15.6

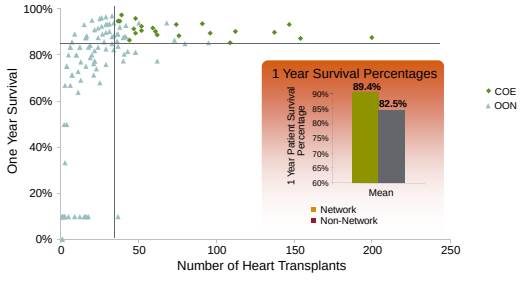
Total Percentage Increase 2002-2011 89.0%
Avg Annual Percentage Increase 2002-2011 10.0%

Billed Transplant charges have almost doubled in less than a decade.

[1]Source: Milliman Cost Estimates from 2011

Network Diligence in Quality Assessment Defining Best of Class

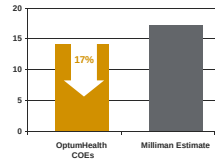
Adult Heart Transplant Centers Volume and One Year Survival



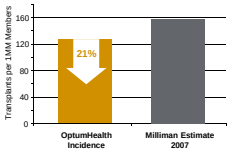
Source for Transplant Volume: SRTR Adult Heart Data from 1/1/2004-6/30/2006; OptumHealth Analysis; 4/2008
Source for One-Year Survival Rate: US Transplant Scientific Registry of Transplant Recipients; 1/2009

Transplant Network Yields Better Outcomes

OptumHealth transplant programs yield an average 17% decrease in hospital length of stay



Clinical expertise leads to a 21% reduction of incidence by avoiding unnecessary and inappropriate transplants, through better diagnosis and more appropriate treatment identification



Value

Quality

What are we measuring?
- Survival
- GVHD
- Compliance
- Quality of life
- Return to Employment

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Cost

Only medical, pharmacy cost?
- Paid claims
- Billed charges
- Starting points
- End point

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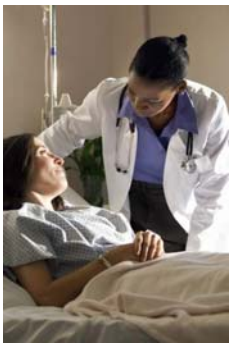
VALUE

Question #1

For a typical employer, what defines quality?

1. Patient and graft survival, any interval
2. Post-transplant complications and readmissions
3. Pre-transplant complications
4. Length of stay
5. Service disruption
6. Cost at the end of the year



What is available to review at Marrow.org?

- Volume by Type of Transplant
  - Auto, MRD Allo, MUD Allo
- Cell Source
  - BMT, PSC, or Cord
- One Year Survival, Actual for combined MRD+MUD
  - Expected outcomes with 95% Confidence Interval
- Survival by Patient's Age, Disease Type and Stage
  - Usually with very small volumes.

The problem
- All are perfect predictors of the past
- No insight into why reported outcomes are what they are

But…

A Tale of Four Stem Cell Transplant Programs

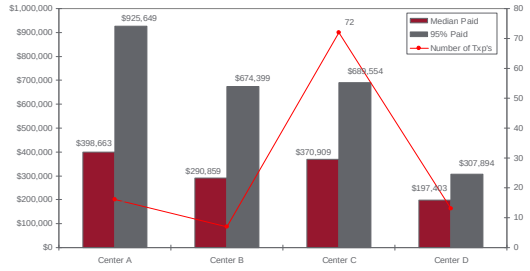
Trending reveals systemic strengths and weaknesses

These programs are clearly different, but they all have one thing in common: they are all within the 95% confidence interval for all reporting periods

BMT COES: Volume and Combined MRD/MUD Survival

CENTER	#	1 yr. Obs	1 Yr. Exp
Center A	530	*68	58
Center B	16	44	67
Center C	724	*59	54
Center D	198	63	58

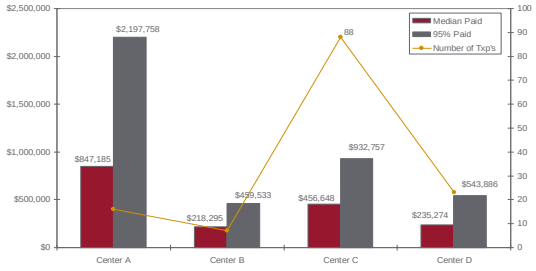
Allo Related BMT Paid Claims Comparison



- The cost statistics above represent transplant cases processed by OptumHealth from 6/07/08-6/07/11
- **95th Percentile** - The billed or paid dollar value that 95% of OptumHealth's re-priced cases have been less than. Among a large group of cases, this number approximates the cost of an uncommon and unusually high cost transplant.

Data Source: OptumHealth claims data

Allo Unrelated BMT Paid Claims Comparison



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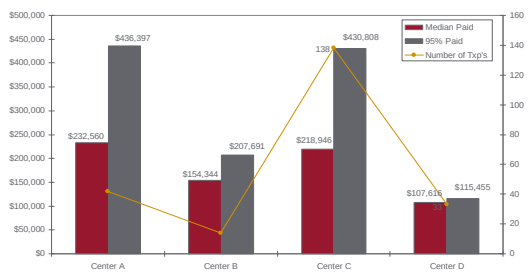
Autologous BMT Paid Claims Comparison



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Question #2

Which factor drives the most variation in cost among centers and programs?

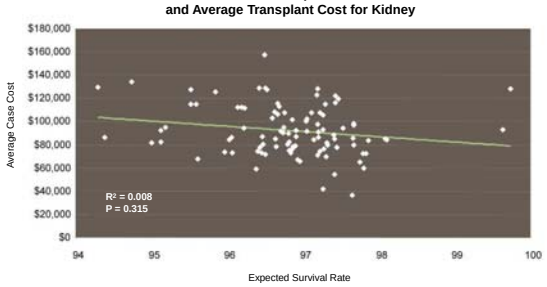
1. Case mix, i.e., risk-adjustment
2. Physician behavior
3. Program structure
4. Institutional support for the transplant program
5. Patient/donor selection and matching
6. Variations in cost of doing business (geography, patient mix, academic programs, High Resolution HLA typing, etc.)

CIBMTR Risk Adjustment Factors

- Disease and stage
- Co-existing disease
- Race of recipient
- Recipient Age
- Donor type/graft type and HLA
- Donor Age
- Recipient CMV status
- Year of HCT
- Karnofsky / Lansky score;
- Conditioning regimen intensity
- Disease sensitivity (NHL and HL only);
- Time from diagnosis to transplant (ALL and AML not in CR1/PIF only);
- Donor/recipient sex match

SRTR risk adjustment does not explain variation in cost

Correlation between Center's Expected Patient Survival Rate and Average Transplant Cost for Kidney



OptumHealth Claims Data, January 2011

Question #3

But, today you are the client:

- HMO
- 500,000 commercial members
- About 35 stem cell transplants annually
  - 24 Autos x $360k= $8.64 M
  - 11 Allos x $805k= $8.85 M
- A and B approximately the same travel time for most of your membership

You have to make a choice.
Which program do you choose?

- Program A
- Program B

Stem Cell Transplant program selection tool

Input Parameters

Transplant type:	Kidney
Age range:	Adult
Meets COE:	Yes
No floor contract:	Yes
Housing:	Yes
Client ZIP Code:	99983

Search radius (select one):
- ○ 25
- ● 50
- ○ 100
- ○ 250
- ○ 500
- ○ National

KEY
- Strongly positive
- Positive
- Neutral
- Negative
- Strongly negative

Output of Query

Stem Cell Transplant Program Attributes	A	B
Distance to center	Strongly positive	Strongly positive
Program integration	Positive	Negative
One year patient survival – predicted (%)	Positive	Negative
One year patient survival – observed (%)	Strongly positive	Strongly positive
One year patient survival trend	Strongly positive	Neutral
Five year volume	Positive	Neutral
Volume trend	Positive	Neutral
Dedicated transplant housing on-campus	Positive	Neutral
Time from referral to start of evaluation	Positive	Neutral
Time from start of evaluation to Transplant	Positive	Negative
Time from donor searches to Harvest	Positive	Negative
Degree of donor mismatches	Positive	Positive
Complications during transplant admission	Positive	Negative
Readmissions first year post-transplant	Positive	Negative
Rate of acute/chronic GVHD	Positive	Negative
QOL one year, two years and three years	Strongly positive	Neutral
Median billed charges (% OptumHealth national average)	Positive	Negative
Variation in billed charges	Negative	Neutral
FACT Accreditation	Strongly positive	Strongly negative
Total cost of health care from referral to three years post-transplant	Positive	Negative
Billed charges compared to Medicare economic adjustment	Positive	Strongly negative
Overall Value	Positive	Negative

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Thank you

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