

COSTS AND CHARACTERISTICS OF PATIENTS WHO UNDERGO BONE MARROW TRANSPLANT (BMT)

Friedman JY¹, Reed SD¹, Glendenning A², Schulman KA¹

¹Duke Clinical Research Institute, Duke University, Durham, NC, USA, ²Novartis Pharmaceutical Corp, East Hanover, NJ USA

Background

- Bone marrow transplant (BMT) is an important technology used in the treatment of cancer patients.
- Cost estimates for this procedure vary greatly, and mainly derive from estimates developed early in the dissemination of the technology.

Objectives

- To describe the inpatient costs associated with an initial hospitalization for BMT.
- To describe costs by discharge status, length of stay (LOS), and diagnosis.

Methods

- 1999 MarketScan data were used to identify patients undergoing BMT and to estimate inpatient costs for the initial transplant hospitalization.
- We included patients who had an ICD-9 procedure code for BMT (41.00, 41.01, 41.02, 41.03, 41.04, 41.05, 41.06) as a primary, secondary or tertiary condition in their claims data.
- We analyzed commercial non-Medicare inpatient claims for patients who underwent initial BMT.
- Costs were comprised of total gross payments to all providers associated with the initial hospitalization for BMT, including physicians and hospital facilities.
- Nonparametric bootstrapping was used to compute confidence intervals for all cost estimates.
- All costs represented are in 1999 US dollars.

Results

Patient Characteristics

	Patients, n (%) ^a
Demographics	
n	69
Age (in years)	
Mean (SD)	44 (17)
Geographic Location	
Northeast US	14 (20)
North Central US	29 (42)
South US	20 (29)
West US	4 (6)
Unknown US	2 (3)
Average Length of Stay (in days)	
Mean (SD)	25.62 (11.38)
95% C.I.	22.89, 28.36

^aExcept where noted.

Mean Total Cost by Length of Stay

	n	Mean Cost, \$ (95% CI)	Min, \$	Max, \$
0-15 Days	10	49,501 (30,262-68,740)	15,064	79,401
16-30 Days	39	74,384 (66,521-82,247)	27,266	147,014
31-45 Days	15	99,050 (78,141-119,958)	40,204	167,172
> 45 Days	5	169,431 (69,456-269,405)	72,238	290,743

Mean Total Cost by Discharge Status

	n	Mean Cost, \$ (95% CI)	Min, \$	Max, \$
Home - self care	52	80,618 (68,229, 93,008)	15,064	290,743
Transfer	1	157,795 †	157,795	157,795
Home - medical care	8	65,291 (50,699, 79,882)	27,379	82,224
Died	6	111,025 (56,430, 165,621)	61,180	190,253

† CI not computed due to small sample size.

- The mean and median costs for claims paid for BMT were \$83,027 and \$76,826, respectively (95% CI: \$72,520, \$93,534).

- The average cost of BMT was significantly more expensive for patients with a diagnosis of leukemia (e.g., chronic myeloid leukemia) (\$94,473) versus patients with other types of cancer (\$72,535) (95% CI for the difference: \$1,639, \$42,498).

Mean Total Cost by Diagnosis

	n	Mean Cost, \$ (95% CI)	Min, \$	Max, \$
Multiple Myeloma	13	75,441 (54,474, 96,408)	15,064	147,127
Non-Hodgkin's Lymphoma	11	99,632 (74,188, 12,5075)	61,735	190,253
Other Cancers	9	66,796 (49,858, 83,734)	3,262	103,390
Myeloma	7	105,977 (68,908, 143,045)	63,055	159,709
Chronic Myeloid Leukemia	6	111,134 (18,260, 204,008)	61,600	290,743

Limitations

- Our analysis included only costs for initial BMT hospitalizations whereas other cost estimates include additional costs, such as costs for rehospitalizations, follow-up care, complications and outpatient medications.
- Clinical information was not available to determine the type of BMT performed (e.g., allogeneic related/unrelated donors).
- We were unable to determine if patients were enrolled in clinical trials. Thus, our cost estimates could be lower due to procedures that were paid for by research protocols.
- Low cost estimates can be attributed to coding errors in the claims data.
- Claims data may not be representative of cost of care.

Conclusions

- Costs for BMT vary by diagnosis, LOS and patient outcomes.
- Our estimate for BMT appears to be less expensive than existing estimates (\$193,000)¹. However, our estimate does not include costs for rehospitalizations, follow-up care, outpatient medications and complications such as graft -versus-host disease (GVHD).



Supported by Novartis AG

This research was conducted in accordance with a protocol approved by the Institutional Review Board at Duke University Medical Center.

Reference:

¹ Westerman IL and Bennett CL. A review of the costs, cost-effectiveness and third-party charges of bone marrow transplant. Stem Cells. 1996;14:312-319.

