Redesigning Care to Lower Episode Costs in Blood and Marrow Transplantation

Presented by
D. Kathryn Tierney, RN, PhD
Oncology Clinical Nurse Specialist, Blood and Marrow Transplantation
Clinical Assistant Professor, Division of General Medical Disciplines

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No relevant disclosures
Objectives

- Understand the leading drivers of cost in BMT episodes of care
- Describe a targeted intervention for redesigning care delivery to reduce post-transplant admissions
- Share lessons learned from our multidisciplinary collaboration
Background: National trends

- Medical expenditures for cancer treatment in the year 2020 is projected to reach at least $158 billion\(^1\)

- For autologous and allogeneic transplants, national average of billed charges starting 30 days prior to 60 and 180 days post are approximately $375K and $925K, respectively.\(^2\)

- In March 2015, the Centers for Medicare and Medicaid Services (CMS) introduced the Oncology Care Model (OCM), inviting commercial payers to join.

- Although Stanford patients receive treatment based on defined protocols, there is opportunity to further improve the quality and efficiency in delivery of care.

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\(^2\)2014 U.S. Organ and Tissue Transplant Cost Estimates, Milliman Research Report
Methodology

- Used internal data 221 allogeneic and 241 autologous transplants occurring from 9/1/2013 – 2/28/2015 (18 months) were identified for analysis

- Episode definition:
  - Examined episode cost for pre-transplant, transplant, and post-transplant phases of care
  - Systematic analysis:
    - By episode, protocol, and charge detail levels
    - Identified areas of high cost and/or high utilization
    - Standard cost categories (e.g. room accommodations, medications, supplies, imaging, and labs)
Episode of Care Findings

• 64.4% of episode costs were associated with pre-transplant and transplant (index) care.
• Index encounter (inpatient or outpatient) accounted for 46.9% of total episode direct costs.
• Post-transplant hospital admissions (unplanned) accounted for 12% of overall episode costs.
Pre-Transplant Phase

- Inpatient admissions, medications and treatment in the Infusion Treatment Area were primary drivers of cost.
- Labs for staging and organ function testing were reviewed and identified as appropriate based on the transplant preparative regimen.
- Minimal opportunity was identified to reduce utilization of high-cost drugs.
- HLA testing costs could be reduced through physician orders and vendor negotiation.
Index - Transplant encounter

- Hospitalization costs are primary drivers of inpatient index costs.
- Costs associated with medications and IV therapy, professional fees, and clinical education and treatment in the Infusion Treatment Area are drivers of outpatient index costs.
- Minimal opportunity: Imaging, medications, and blood utilization met clinical indications and treatment protocol
Opportunity identified in Post-Transplant Phase

- 68% of overall post-transplant hospital admissions were infection-related
  - Total direct cost = $4.7 million/year
- Opportunity identified in autologous transplant population
  - 91% of post-transplant admissions were infection-related
  - Admitted 5-9 days after transplant
  - Short length of stay (Mean = 7 days; Median = 6 days)
  - Majority with negative infectious workup and treated empirically with antibiotics

**Hypothesis:** Autologous multiple myeloma patients with neutropenic fever could be safely managed as outpatients, thus avoiding a post-transplant admission.
Chart Review Findings

- Conducted to understand demand, logistics, and timing of post-hospital admissions
- Reviewed admissions (n=41) for Auto MM patients during 1/1/2016 – 6/30/2016
- 49% (20/41) developed neutropenic fever.
- 75% (15/20) were admitted for neutropenic fever alone. The remaining 5 cases were admitted for additional reasons (e.g. mucositis pain control).
  - 100% (20/20) had fever onset within 4-9 days post-transplant
  - 80% (16/20) with negative infectious workup and treated with empiric antibiotics
  - 50% (10/20) with fever duration of 1 day
Home Pharmacy implications:
- With the current Stanford Home Pharmacy hours and staffing levels, presentation on a **weekday before 2pm** is the only scenario that allows sufficient time for **same-day home IV antibiotic medication delivery**.
- Among the 15 patients admitted due to neutropenic fever:
  - 7% (1/15) presented on a weekday before 2pm
  - 93% (14/15) presented on a weekend or on a weekday after 2pm

### % Patients Trajectories and Time of Fever (F) Onset

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<th>% Patients</th>
<th>40%</th>
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<td>ITA (regular appt)</td>
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<td>ITA (regular appt)</td>
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<td>Home</td>
<td>ITA (next-day urgent appt)</td>
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**Hours:**
- ITA: M-F 7:30am-9pm, Sat 7am-7pm, Sun 8am-7pm
- Home Pharmacy: M-F 9am-5:30pm, Sat-Sun closed

**Home Pharmacy implications:**
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We can shift care safely from inpatient to outpatient by redesigning care delivery.

**Strategies:**
- Develop standardized treatment plans
- Establish clinical criteria for eligible population (risk stratification)
- Expand ITA and Home Pharmacy capacity
- Partner with local home health agencies
- Provide ready access to ancillary services (labs and radiology)

Projected cost savings for auto multiple myeloma post-transplant admissions for neutropenic fever = $790,000
Project Update

- On December 5, 2016, SHC implemented home IV infusion management of autologous multiple myeloma patients who develop neutropenic fever (*without* Home Health)
  - Total of 10 patients awaiting engraftment during initial 4 weeks of pilot
    - Only 1 patient met criteria for outpatient management but was admitted due to caregiver’s concerns over ability to care for patient at home

- Home Health Partnership target implementation in Spring 2017
  - Develop training program led by Stanford for home health nurses
  - Negotiate contracts with payors
  - Implement standardized workflows

- In process of identifying populations for expansion
  - Allogeneic BMT patients
  - Other oncology patients
  - Solid organ transplant patients
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