BMT Pre-Transplant Process: Reducing Safety Events

David A. Jacobsohn, MD, ScM, Karla Gonzalez, MHSA,
Sameeya Ahmed-Winston, CPNP, CPHON, BMTCN

Background

- A bone marrow transplant (BMT) is a procedure to replace damaged or destroyed bone marrow with healthy bone marrow stem cells.
- Many staff are involved in clearing a patient and getting them ready for a BMT:
  - MD, Advanced Practice Provider (APP), Nurse Coordinator, Social Work, Nutrition, Financial Coordinator, Scheduler, Program Associate, referring team
- Clearing a patient involves setting up a consult, getting referral paperwork, educating the family about BMT, obtaining consents and bloodwork, scheduling the patient and donor– all requiring clear communication between staff to ensure every step is completed before the transplant.

Challenges

Recent growth in the BMT program required the expansion of the team which introduced several issues that included:

- Lack of clear expectations on roles and responsibilities
- Duplication of work
- Work done incorrectly
- Timelines were not clearly defined
- Poor communication with referring providers
- Increase in safety events

Aim

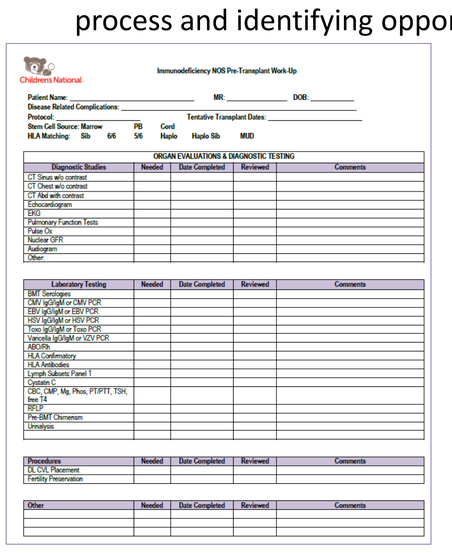
Streamline the Bone Marrow pre-transplant process and reduce safety events – from referral to admission

Actions Taken

The Bone Marrow Transplant team engaged in a Value Stream Mapping (VSM) event, where they developed the following solutions using Lean principles:

- Created short, standard, disease-specific referral templates
- Established back up roles within the department
- Developed patient tracking tool
- Reviewed and updated donor and recipient standard operating procedures (SOPs)
- Reviewed and eased readability level of consent forms
- Developed pre-workup checklist
- Established process with referring teams within CNMC when transferring patient care
- Updated all orders with the goal of creating order sets
- Established monthly meetings with the Laboratory to discuss pre-BMT concerns

BMT Team mapping the current state for the pre-transplant process and identifying opportunities for improvement



Immunodeficiency NOS Pre-Transplant Work-Up

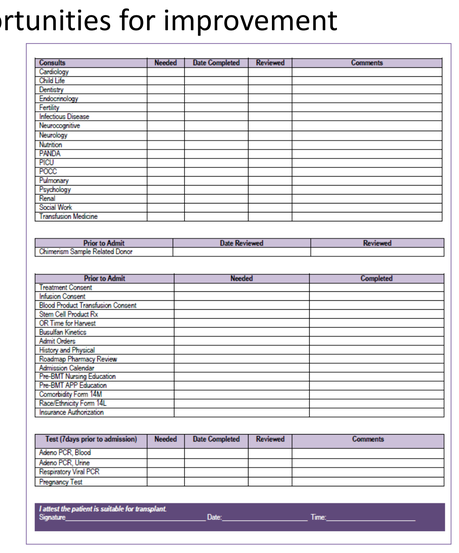
Patient Name: _____ MR: _____ DOB: _____
Disease Related Complications: _____
Protocol: _____ Tentative Transplant Dates: _____
Stem Cell Source: Marrow PB Cord
HLA Matching: Sib 6/6 5/6 Haplo Haplo Sib MUD

ORGAN EVALUATIONS & DIAGNOSTIC TESTING				
Diagnostic Studies	Needed	Date Completed	Reviewed	Comments
CT Sinus w/o contrast				
CT Chest w/o contrast				
CT Abd with contrast				
Echocardiogram				
EKG				
Pulmonary Function Tests				
Pulse Ox				
Nuclear GFR				
Audiogram				
Other:				

Laboratory Testing	Needed	Date Completed	Reviewed	Comments
BMT Serologies				
CMV IgG/IgM or CMV PCR				
EBV IgG/IgM or EBV PCR				
HSV IgG/IgM or HSV PCR				
Toxo IgG/IgM or Toxo PCR				
Varicella IgG/IgM or VZV PCR				
ABO/Rh				
HLA Confirmatory				
HLA Antibodies				
Lymph Subsets Panel 1				
Cystatin C				
CBC, CMP, Mg, Phos, PT/PTT, TSH, free T4				
RFLP				
Pre-BMT Chimerism				
Urinalysis				

Procedures	Needed	Date Completed	Reviewed	Comments
DL CVL Placement				
Fertility Preservation				

Other	Needed	Date Completed	Reviewed	Comments



Consults	Needed	Date Completed	Reviewed	Comments
Cardiology				
Child Life				
Dentistry				
Endocrinology				
Fertility				
Infectious Disease				
Neurocognitive				
Neurology				
Nutrition				
PANDA				
PICU				
PODC				
Pulmonary				
Psychology				
Renal				
Social Work				
Transfusion Medicine				

Prior to Admit	Date Reviewed	Reviewed
Chimerism Sample Related Donor		

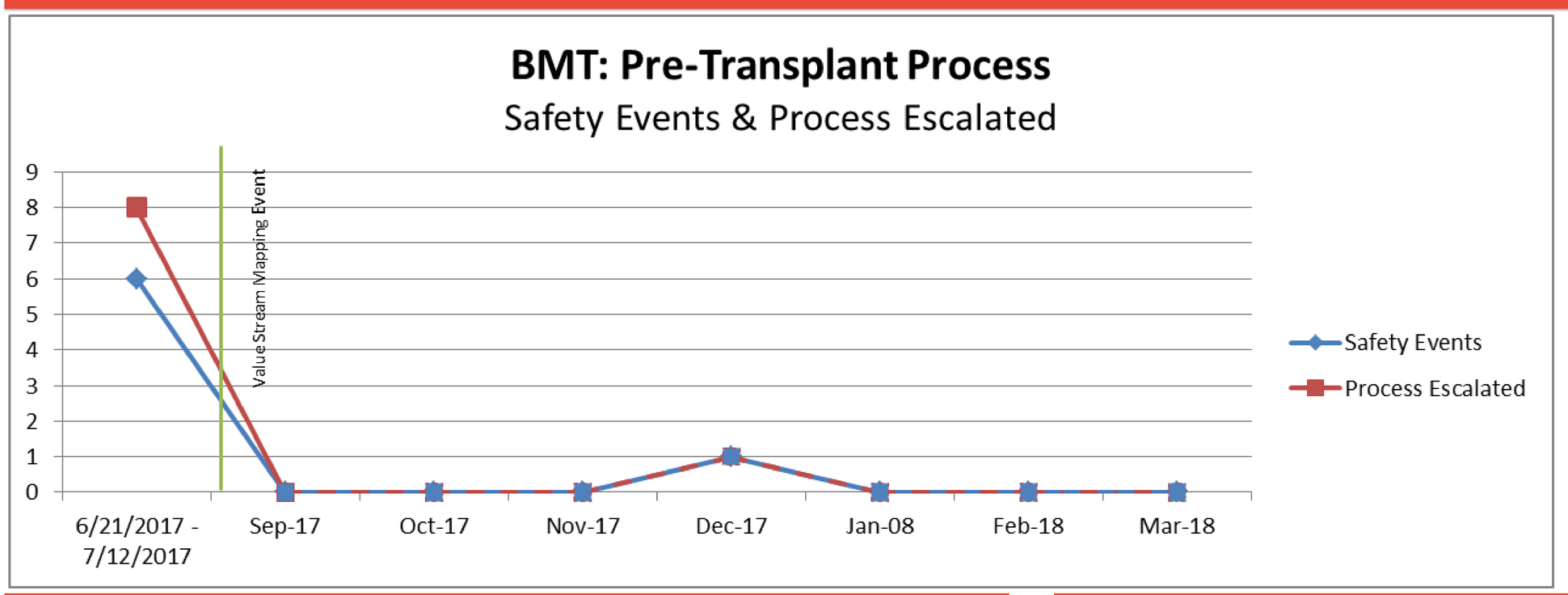
Prior to Admit	Needed	Completed
Treatment Consent		
Infusion Consent		
Blood Product Transfusion Consent		
Stem Cell Product Rx		
OR Time for Harvest		
Busulfan Kinetics		
Admit Orders		
History and Physical		
Roadmap Pharmacy Review		
Admission Calendar		
Pre-BMT Nursing Education		
Pre-BMT APP Education		
Comorbidity Form 14M		
Race/Ethnicity Form 14L		
Insurance Authorization		

Test (7days prior to admission)	Needed	Date Completed	Reviewed	Comments
Adeno PCR, Blood				
Adeno PCR, Urine				
Respiratory Viral PCR				
Pregnancy Test				

I attest the patient is suitable for transplant.
Signature_____ Date:_____ Time:_____

New Pre-BMT Workup Checklists

Results



Safety Events included:

- Rushed workups
- Lab delays

83% improvement

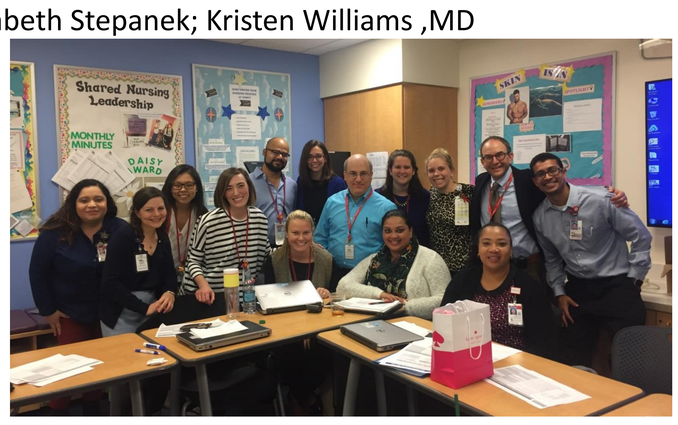
Escalating the process required:

- Multiple phone calls/emails
- Expedited workup
- Active coordination

88% improvement

Lessons Learned

- **Communication is critical in any process.** With the pre-transplant process it reconfirmed its importance due to multiple moving parts and many individuals involved in the process.
- **Engagement from all roles in the process**, from coordinator to providers, allowed for consensus and understanding of everyone's roles and responsibilities.
- Having **front line staff make changes to their own process**, as opposed to management, increases staff engagement and ownership.

Project Team

Emily Abbey, NP; Allistair Abraham ,MD; Sandra Andrade; Chelsea Baldwin; Samrawit Berhane; Blachy Davila ,MD; Jennifer Ha; Dennise Lim; Kelly Lyons ,NP; Evelio Perez-Albuerne, MD; Elizabeth Stepanek; Kristen Williams ,MD