which the patients were divided into quartiles according to their hematologic and immunologic indices. WBC and absolute neutrophil counts were not closely correlated with subsequent survival. Patients in the lowest quartile of the absolute lymphocyte and platelet count distributions, however, experienced significantly inferior survival beyond one year ($p<0.012$ and $<0.001$, respectively) when compared with patients in the highest quartile (reference group). Patients in the lowest quartiles of the absolute CD4+, CD19+, CD56+, and serum IgG distributions also experienced significantly inferior survival ($p=0.019$, $0.001$, $0.02$, and $0.023$, respectively). These results demonstrate that poor CD19+ B cell recovery at 1 year is associated with inferior survival, and suggest that interventions aimed at enhancing B cell reconstitution may have clinical benefit.

**184**

**Pediatric Post Transplant Neutrophil Function**

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Allogeneic stem cell transplant (ASCT) is a life saving procedure for children with diverse malignant and non-malignant conditions. The conditioning regimen renders the patient very susceptible to infection until neutrophil (PMN) engraftment occurs. In pediatric patients it is not known if these newly engrafted PMN's function normally, nor is it known how long they take to become fully functional. We hypothesize that pediatric patients, like their adult counterparts, demonstrate PMN dysfunction at the time of engraftment and beyond, which will be influenced by, the conditioning regimen, stem cell source and level of GVHD, and may predispose these children to serious bacterial and fungal infections. Peripheral blood specimens were collected from pediatric patients at Children's Hospital Colorado at 1, 2, 3, and 6 and 12 months post ASCT. PMN's were isolated using standard technique of ficoll gradient, followed by hypotonic lysis. PMN activity was assessed looking at 1) superoxide ($O_2^-$) production (luminescence); 2) azurophilic granule release (colorimetric assay for elastase); 3) secondary granule production (lactoferrin ELISA); 4) CD11b surface expression (flow cytometry), and; 5) phagocytosis (PhagotestTM, a flow cytometry assay).

**Results:** To date 22 patients have been enrolled; and over 50 samples obtained out to the 6 month post ASCT, with many approaching 12 months post ASCT. Mean age of the participants is 10.8 years, and 65% are male. Engraftment period has averaged 24 days. Transplant types include eleven cord bloods, six matched-related bone marrow donors, and three matched-unrelated bone marrow donors. PMN function appears to be relatively intact with no significant differences noted between healthy controls and sample specimens at all time points in relation to $O_2^-$ production, phagocytosis, CD11b surface expression and lactoferrin. The lone exception is with elastase release which is significantly decreased at all time points versus controls ($P<0.05$); with a slow improvement seen over time (Figure 1). Subgroup analysis did not show a preferential difference in elastase release in relation to specific stem cell source or conditioning regimen. We conclude that similar to adults, pediatric patients have PMN dysfunction which appears to be restricted to elastase release and continues 6 months post ASCT. A defect of this type is somewhat similar to Chediak-Higashi and may put patients at higher risk for serious bacterial infections, particularly staphylococcus and streptococcus.

**185**

**B Cell Engraftment in SCID Patients After Stem Cell Transplantation**

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Stem cell transplantation (SCT) is the only curative option for patients (pts) with Severe combined immunodeficiency (SCID). Adequate T cell function is usually achieved in these pts after SCT. Unfortunately, however, adequate B cell function often fails, and little is known about how disease type, conditioning or stem cell graft influence this process. We report B cell function reconstitution following SCT (1998-2012) in 35 SCID pts: IL2RG (n=13), JAK3 (n=2), RAG1, 2 (n=2), IL7RA (n=5), CD3D (n=4), Zap70 (n=2), MHCIi def (n=1), ADA (n=2), and not differentiated (n=4). Fourteen pts received a haploidentical donor graft, 8 pts a matched related donor (MRD) graft, 7 pts a matched/mismatched unrelated donor (MUD/MMUD) graft, and 7 pts a mismatched unrelated cord blood (MMUCB) graft. One pt received a MUCB after a haploidentical graft failure. 23 pts underwent ablative conditioning with busulfan, cyclophosphamide, and fludarabine or cytarabine, 7 pts a reduced intensity conditioning using fludarabine and anti-CD52 and/or anti-CD45. Five pts were not conditioned. Anti-CD52 was used in 22 pts. MMUCB recipients receive no serotherapy. Overall survival of the entire cohort was 87% with a median follow up of 6 years (range, 0.5 -13 years); MUD and MMUCB graft recipients had a 100% survival. To determine functional B cell engraftment we measured IgA and total IgG. Engraftment was considered successful when IgA was normal and levels of IgG were above 500 mg/dL without supplemental IVIG. Adequate B cell function of the whole group occurred at a median time of 4 years (range, 2-13 years) in the haploidentical and MRD recipients, at 3 years (range, 2-6 years) in the MUD/MMUD recipients and at just 6 months (range, 4-11 months) in the MMUCB recipients. Five of 28 evaluable patients (3/14 haplo and 2/8 MUD) failed to achieve