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House of Representatives Subcommittee on Health Care, District of Columbia, Census, and National Archives

Chairman and members of the Subcommittee:

Thank you for inviting me to testify today. I am the Chief of the division of pediatric hematology/oncology and the Director of pediatric blood and marrow transplantation for the Medical University of South Carolina in Charleston, SC. I care for close to 75 newly diagnosed children with cancer each year as well as almost 30 children each year from throughout the Southeast who require a bone marrow transplant for their best chance of survival from cancer.

The National Cancer Act (P.L.92-218) in 1971 officially declared the war on cancer. Since that time, the overall survival rate of childhood cancer has dramatically improved from 10% to almost 80%. However, the incidence of childhood cancer has continued to increase over the past 20 years, and cancer remains the leading cause of death by disease in children. In 23 days, we will mark the 40th anniversary of the National Cancer Act being signed into law. Today, unfortunately, we mark the largest number of chemotherapy drugs ever in shortage. The war on cancer has been reduced to a mere skirmish with no weapons and no clear battle plan.

Just a few days ago, I was with a family in crisis in our pediatric emergency room. I had to tell the parents of a 2 year old boy that their son has high risk acute lymphoblastic leukemia. This type of leukemia, known as ALL, is the most common childhood cancer. For his first month of treatment, he needs four chemotherapy drugs plus another two chemotherapy drugs to be injected into his spinal fluid. Five of these six drugs are in shortage. Each of these drugs in shortage is a generic drug. Mercifully, we have the drugs available right now. I held his mother's hand and told her that we will do everything humanly possible to cure her son. He needs three and a half years of chemotherapy treatments- will I be able to tell her the same thing a month from now? 6 months from now? In a year?

The scope of the problem continues to intensify. Between 2005 and 2010, the number of prescription drug shortages nearly tripled in the United States. Currently, 21 chemotherapy drugs are in shortage as well as 2 essential chemoprotectant drugs. The vast majority of drugs in shortage are generic drugs and are used to treat curable childhood cancers. Drugs such as cytarabine, which is essential to cure acute myelogenous leukemia (AML), have absolutely no substitution available. Clearly, the most critical problem is a child being denied curative chemotherapy treatment due to the drug shortages.

Furthermore, the additional downstream effects of chemotherapy shortages have significant ramifications as well. Research cures cancer. The major advancements in pediatric cancer, as well as adult cancer, have occurred through the Clinical Trials Cooperative Group program of the National Cancer Institute. The majority of clinical trials incorporate

elements of standard treatments into one or more treatment groups in the trial. Clinical trial enrollment is currently not allowed unless there is clear access to the chemotherapy drugs included in the trial. As a result, clinical trial enrollment is declining. Not only does this undermine the advancement of cancer treatment, but it comes with a significant financial cost to the taxpayer as well. Cooperative group clinical trials are estimated to have $5-6,000 of regulatory costs per institution that are incurred even if a patient never enrolls on the clinical trial. For instance, the Children's Oncology Group (the Clinical Trial Cooperative Group for pediatric cancer) has 210 member institutions and roughly 100 active clinical trials each year. Consequently, up to 1.2 million dollars could be wasted each year alone for pediatric cancer clinical trials that are never able to enroll any patients due to chemotherapy drug shortages.

A recent study published in the *American Journal of Health-System Pharmacy* reported that the overall personnel costs associated with managing drug shortages costs health systems an estimate of $216 million each year. The increased burden affects pharmacists, pharmacy technicians, physicians, nurses, and information technology personnel. Additional time and effort is spent educating staff about shortages and potential drug substitutions when they exist. Regrettably, most institutions have had to institute a review board, often with involvement of their institutional ethics committee, to develop harrowing plans of how to ration chemotherapy drugs- most of which are generic drugs that have been around for 30 years or more. How do you decide who should be given the chance to live?

In an effort to maintain some semblance of adequate chemotherapy treatment, drug substitutions are being made with less familiar products. Additionally, pharmacies are stocking multiple concentrations of the same drug. A cardinal rule of drug safety is to stock one concentration of any particular drug so that all staff is readily familiar with the preparation. Now, the focus is simply on having drug available and pharmacies have multiple concentrations of the same drug. This can rapidly lead to dosing errors- either underdosing or overdosing- when one concentration of the drug is mixed for the patient as if it is the other concentration of the drug. Chemotherapy agents are high-alert drugs. They have a narrow therapeutic index, meaning there is a small difference in the amount that causes the therapeutic benefit and the amount that causes death. Over a year ago, a national survey by the Institute for Safe Medication Practices noted that 35% of respondents had experienced a "near miss" error due to drug shortages and that 25% reported actual errors that reached the patient. One-third of physician responders reported an adverse patient outcome due to drug shortages.

As with any critical issue, there are multiple reasons for current drug shortage crisis. However, the timing of the current drug shortage is notable. In 2003, the Medicare Modernization Act (MMA) was put into place. In 2004, the FDA reported 58 drug shortages; in 2011, the number is over 200. The intent of the Medicare Modernization Act was to create more transparency in pricing. With the MMA, the reimbursement rate moved from a percentage of average wholesale price to average selling price, which includes all discounts, rebates etc in the sale. Generic prices are driven down by market competition and the current model under the MMA makes it difficult for companies to raise prices more than 6% per year. Product margins have fallen significantly for many generic drugs, leaving companies with little incentive to continue manufacturing the drug or to increase production.

In addition to addressing regulatory and notification issues regarding drug shortages, a key component of the solution is addressing the economic issues underlying the drug shortage crisis. Potential components of the economic solution include offering financial incentives to ensure a steady supply of product as well as increasing the Medicare reimbursement amount.

The current situation is nothing short of a massive national emergency. The burden is on us to resolve the crisis in order to protect our children. None of my patients's families ever thought they would be faced with a diagnosis of childhood cancer. Today alone, the parents of 36 children in the US will be told their child has cancer. Let's act to ensure that these parents can also be told there are chemotherapy drugs available to cure their child.