The high cost of prescription medications is a growing problem in US health care. Oncology is well acquainted with this problem, as the prices of new cancer drugs have been increasing exponentially in recent decades. As a result of the increasing number of highly-priced chemotherapeutics combined with increasing out-of-pocket costs from higher deductibles and co-insurance, many cancer patients experience “financial toxicity” and may be unable to afford treatment. In response, many pharmaceutical companies offer various forms of financial assistance. These include copay assistance and copay coupons, direct grants to patients, pricing discounts, and in-kind gifts of drug supplies free of charge. One mechanism by which companies deliver in-kind gifts of drug supplies free of charge is 

**Pharmaceutical Assistance Programs (PAPs).** PAPs are industry-administered programs that provide free drugs to patients who demonstrate sufficient financial need. However, PAPs can be time-consuming, opaque, and difficult-to-navigate sources of assistance. The overall scope and impact of PAPs in cancer care financing are unknown.

In this study, we sought to quantify and characterize the role of PAPs at an academically-affiliated, integrated health system in the state of North Carolina.

**METHODS**

The University of North Carolina Health Care System administers an institutional medication assistance program (MAP). Patients with potentially prohibitive drug costs are identified and referred to the MAP by clinical pharmacists. On referral, MAP specialists work to meet the financial need through copay assistance programs and foundational grants; if these sources are unavailable or insufficient, they submit an application to the relevant PAP for the needed drug.

UNC MAP administrative records—which include all successful PAP applications—were our primary data source, supplemented by manual chart review to ascertain patient insurance type and cancer type. In our analysis, we included PAP applications for cancer drugs, defined as anti-neoplastic agents and agents with non-oncologic indications given in the context of a cancer treatment protocol (e.g., pegfilgrastim), during 2014.

Totals for UNC cancer patients with each cancer type, and patients treated with each drug, were obtained from codified EMR data. Total values of drugs obtained via PAPs were calculated by multiplying per-unit Average Wholesale Price (AWP) at time of application (contained in UNC MAP records) by quantity obtained. Missing drug quantities (5.2% of applications) were imputed using the amount needed for a single IV infusion or a 1-month pill supply.

While 40% of UNC cancer patients receiving PAP assistance were uninsured, the majority wereinsured by public or private payers (Figure 1). This study provides further evidence that many insured patients are unable to meet the cost-sharing requirements imposed by high-cost cancer drugs.

The majority of drug value obtained via PAPs ($5,373,741 of $9,801,090, 75.2%) was for oral rather than intravenous drugs (Figure 2). This suggests a particular difficulty for patients in affording prescription cancer drugs.

A total of 215 of 8,559 UNC cancer patients (2.5%) used PAPs to acquire one or more cancer drugs (not shown). Compared to a prior study of an institutional medication assistance program in 2006-2007 which found that 1.1% of cancer patients received PAP assistance, this suggests that the need for charity drug assistance may be increasing.

**RESULTS**

**Figure 1 (Left):** Percentage of patients treated with a drug from each cancer type (top), or those receiving all drugs via PAP (bottom) across all patients. Percentages (y-axis) of patients receiving each drug via PAP (x-axis) are shown. The majority of patients treated with a drug were receiving them via MAP. The majority of drug value obtained via PAP was for oral medications.

**Figure 2 (Right):** Value of drug obtained from PAPs, by type of drug. The total value of drugs obtained via PAPs across all patients, USD. Non-oral drugs include those administered intravenously, subcutaneously, intramuscularly, and intranasally. Overall, UNC patients obtained a total value of $16,801,990 in drugs via PAPs during 2014. Oral drugs constituted $7,573,741 ($75.2%) of this total.

**Table 1 (Right):** Top-10 cancer drugs by greatest total value obtained from PAPs. Orally-administered cancer drugs were common among the drugs with the highest value obtained from PAPs. The drug with the greatest total value obtained via PAPs was imatinib ($1,556,575), and the drug with the greatest average patient value obtained was crizotinib ($259,858). Sub-q, subcutaneous; IV, intravenous.

**Table 2 (Left):** Distribution of PAP utilization among different cancer types during 2014. Total numbers for each cancer type at UNC for each drug were obtained by searching codified EMR data, and numbers for patients receiving drugs via PAPs were obtained from administrative records from the UNC medication assistance program. For each cancer type, the single drug with the highest total value obtained via PAPs across all patients was identified. Several drugs (such as imatinib, sorafenib, and pegfilgrastim) were the highest-cost drug for several cancer types.

**Conclusions**

A few, high-cost medications constituted the majority drug value obtained by UNC cancer patients, particularly orally-administered “targeted” drugs. Two drugs alone—imatinib and dasatinib—constituted $3,086,208 in value, which was 31% of total value across all drugs (Table 1). Patients with the cancer types that are most commonly treated with these drugs, such as chronic myeloid leukemia (CML) and kidney cancer, tended to require the most PAP assistance (Table 2).

PAPs have opaque application and approval processes and administrative delays can lead to gaps in treatment. Therefore, they are not an ideal mechanism for a significant fraction of cancer patients to rely on in order to obtain standard-of-care treatments. Both improved access and reduced drug prices are required to meet this growing need.