

## Does cost drive adherence? The designer drug phenomenon.

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**Background:** Cancer patients (pts) are on many medications, both for malignancy and supportive therapies. The cost of oral medications are funded by either the pt, public, or private mechanisms. Low adherence rates are observed in oral treatments, and non-adherence is the primary cause of treatment failures. To our knowledge, cost-related adherence to oral therapy in the context of malignancy has not been studied extensively in the existing literature. We assessed the relationships between oral medication costs and adherence rates. **Methods:** This cohort study enrolled 453 pts at 3 outpatient heme/onc clinics in the Greater Toronto Area. A 7-item survey was designed to assess pt demographics, self-reported adherence to oral medication, type of drug coverage (private payer, public payer, self payer) and patients' perceived cost of oral drugs. Oral medications were recorded and actual monthly costs were calculated. Descriptive statistics were used to describe frequencies. Spearman Rank Order Correlations and Chi-Square Analyses were used to examine relationships between variables. **Results:** Of 453 pts, 50% had a private drug plan, 24% paid out of pocket, 44% had government funding and 4% reported their physician had arranged funding. 51% of pts had oral drug costs of  $\geq$  \$100/month. Self reported adherence to prescribed oral medications was 80%. As the cost of prescribed medications increased, so did self reported adherence ( $r=0.144$ ,  $p=0.002$ ). There was also a significant relationship between drug coverage and oral drug costs ( $\chi^2=23.78$ ,  $df=12$ ,  $p=0.02$ ). Pts paying out of pocket were significantly less likely than all other pts to have oral drug costs of  $\geq$  \$500/month (11% vs 19%) **Conclusions:** As oral drug costs increase, so does likelihood of adhering to prescribed regimen. This implies that further pt education about the efficacy and importance of medications may help with adherence, regardless of cost. It is possible that pts are provided with more education regarding newer and more expensive agents than they are regarding older and cheaper agents, regardless of efficacy. Disparities observed in medication costs between those with private drug plans vs. those without suggests financial restrictions may affect prescription patterns in this group.

NOYCIA Selection Committee

April 19, 2012

Dear Colleagues,

I am writing this letter in strong support of Jalal Ebrahim's application for a NOYCIA award for his abstract "Does drug cost drive drug adherence? The designer drug phenomenon".

Through his work on this project, Jalal has demonstrated expertise not only in research methodology, data collection, analysis and presentation, but also expertise in the key skills of research collaboration that cannot be taught and are difficult to perfect.

In a very short period of time (4 months) Jalal was able to grasp the concept and key ideas for this study and honed in on some of the barriers we were facing in data collection. He quickly and energetically completed data collection at St. Michael's, and was instrumental in collaborating with other centres to ensure timely collection of accurate data. Jalal expanded the scope of this project which directly related to its successful acceptance for presentation at ASCO. Through his collaborative connections at Southlake and Princess Margaret Hospital he managed to collate the data from all centres and was able to clean and analyze this data using SPSS software. His statistical analysis was thoughtful and correct and his skills in statistical analysis are impeccable and will continue to serve him well in his future research endeavors. Once the data was analyzed, Jalal was able to interpret the data and developed the abstract independently.

Jalal is within the top 5% of trainees that I have worked with (including medical students, residents and fellows). Due to his propensity for clinical research and his skillful ability to foster collaboration, I have no doubt that Jalal is a rising star in oncology research. I believe he truly represents a young Canadian oncology investigator and is very deserving of this award.

With sincere thanks,

Christine Simmons, MD MSc FRCPC  
Medical Oncologist, St. Michael's Hospital  
Assistant Professor, University of Toronto  
Chair and Founder, Women in Cancer

## JALAL EBRAHIM

Based out of St. Michael's Hospital in Toronto, Canada, I was heavily involved in research and preparation of the abstract "Does drug cost drive drug adherence? The designer drug phenomenon". The goal of this project was to examine how patients paid for oral medications, how much they paid, and the relationship between these variables and adherence to prescribed regimen.

Over the latter half of 2011, I administered 236 questionnaires at St. Michael's Hospital, identifying eligible patients in the oncology/haematology medical daycare unit and the chemotherapy suite. I enjoyed working with participants, and often sat with them for 20 to 30 minutes, discussing the consent form and questions on the survey. In order to verify oral drug costs, I performed chart reviews on all 236 participants and recorded current medications. Next, I coordinated with the pharmacy of a nearby hospital to draft a list of relevant drug costs and used this list to calculate monthly oral drug costs for each patient. I also coordinated the administration of 217 additional questionnaires at Princess Margaret Hospital and Southlake Regional Health Centre. Once this was complete, I collected the 453 physical surveys and manually entered the responses into a Microsoft Excel database. Next, I collated the data and performed statistical analysis (specifically Spearman Rank Order Correlations and Chi-Square Analyses) using IBM SPSS Statistical Software. I was also responsible for interpretation of statistical results and writing the abstract.

In addition, I drafted and submitted a Research Ethics Board (REB) renewal in December of 2011. For the vast majority of this study, I was responsible for answering any questions from co-authors and other researchers on our team. Ultimately, our research suggested that as oral drug cost increased, so did patient adherence to prescribed regimen. Therefore, I'm currently drafting a follow up study to examine potential mediating factors in this relationship (e.g. do patients perceive more expensive drugs as more efficacious? Do physicians spend more time discussing more expensive drugs?).

Working on this project has been one of the most challenging and rewarding experiences in my young career. Thank you for your consideration.

**Contribution percentage:**

70%