

Supplementary Materials

Table S1. Estimated cost of therapies included in the referent clinical study [10].

Chemotherapy	Cost ^a
Carboplatin	\$1,048
Paclitaxel	\$1,006
Carboplatin/paclitaxel	\$2,049
Carboplatin/docetaxel	\$5,159
Carboplatin/gemcitabine	\$2,897
Carboplatin/topotecan	\$5,715
Cisplatin	\$1,020
Cisplatin/gemcitabine	\$3,100
Cisplatin/paclitaxel	\$1,930
Doxorubicin ^b	\$27,286
Gemcitabine	\$3,477
Topotecan	\$5,654

^a Inclusive of the cost of chemotherapy agent(s) included in the regimen plus the cost of administration in the physician office setting, for a total of 6 cycles.

^b Pegylated liposomal doxorubicin

Table S2. Results for the model using the least expensive chemotherapy within the patient's highest category of sensitivity in the assay consistent cohort. The range in the ICER/LYS was estimated by independently sampling 1000 times from each of the two 95% CI of the HRs for the assay.

	Baseline cohort	Assay consistent cohort	ICER/LYS (range)
Average cost per patient	\$ 39,610	\$ 37,704	
Median overall survival	25 months	28 months	
Mean overall survival	29.8 months	32.3 months	\$ -9,149 (-\$15,585, -\$6,429)

Methods

Obtaining the transition probability matrices

To estimate p_{11} , p_{21} , p_{31} , p_{22} and p_{32} from Figure 1, the results of Rutherford et al. were parsed into two analyses of survival times vs. the platinum sensitivity status (PS vs. PR) and the assay sensitivity result (S vs. IS or R). The first analysis models the time from the beginning of the study to disease progression and death following remission, using a marginal Cox proportional hazard regression [15]. An “event stratum” dummy variable accounts for the type of event: disease progression since the beginning of the study and death since the beginning of the study. All subjects are at risk for both events. Using the distribution in Table 1 and the marginal model in Table 2, we set in the baseline cohort:

$$p_{11} = 0.17 \times \widetilde{P}_{11}^1(S > t_{i+1}|S > t_i) + 0.38 \times \widetilde{P}_{10}^1(S > t_{i+1}|S > t_i) + 0.11 \times \widetilde{P}_{01}^1(S > t_{i+1}|S > t_i) + 0.34 \times \widetilde{P}_{00}^1(S > t_{i+1}|S > t_i), \quad (1)$$

where $\widetilde{P}_{kl}^1(S > t_{i+1}|S > t_i)$, $i = 1, \dots, 34$, corresponds to the midrange of the conditional probabilities of staying in remission 2 at time t_{i+1} , given remission 2 at time t_i , for the platinum sensitivity group k , $\{k = 0, 1\}$, and chemoresponse assay outcome group l , $\{l = 0, 1\}$. The midrange was computed over $i = 1, \dots, 34$, since $t_{34+1} = 35$ was the maximum follow up time for disease progression from the beginning of the study in the assay R/IS and platinum resistant group in Rutherford et al. [10]. This was the shortest follow up time for disease progression of all four clinical groups. The superscript 1 specifies the “event stratum” corresponding to disease progression since the beginning of the study. Using the same survival model and the above probabilities,

$$p_{31} = 1 - 0.17 \times \widetilde{P}_{11}^0(S > t_{i+1}|S > t_i) - 0.38 \times \widetilde{P}_{10}^0(S > t_{i+1}|S > t_i) - 0.11 \times \widetilde{P}_{01}^0(S > t_{i+1}|S > t_i) - 0.34 \times \widetilde{P}_{00}^0(S > t_{i+1}|S > t_i) \quad (2)$$

where the superscript 0 specifies the “event stratum” corresponding to death since the beginning of the study. Finally,

$$p_{21} = 1 - p_{11} - p_{31}. \quad (3)$$

The transition probabilities p_{11} , p_{21} and p_{31} in the assay adherent cohort are defined similarly, using the appropriate weights in the last row of Table 1.

The second analysis models the time from disease progression to death using a conditional proportional hazard regression for recurrent events [16]. The event stratum dummy variable accounts for two types of events: disease progression since the beginning of the study and death since disease progression. Each subject is assumed not to be at risk for death until disease progression has occurred. Thus, using the distribution in Table 1 and the conditional model in Table 2, we set in the baseline cohort:

$$p_{22} = 0.17 \times \widetilde{P}_{11}^0(S > t_{i+1}|S > t_i) + 0.38 \times \widetilde{P}_{10}^0(S > t_{i+1}|S > t_i) + 0.11 \times \widetilde{P}_{01}^0(S > t_{i+1}|S > t_i) + 0.34 \times \widetilde{P}_{00}^0(S > t_{i+1}|S > t_i) \quad (4)$$

where $\widetilde{P}_{kl}^0(S > t_{i+1}|S > t_i)$, $i = 1, \dots, 34$, corresponds to the midrange of the conditional probabilities of staying in state 2 at time t_{i+1} given state 2 at time t_i for the platinum sensitivity group k , $\{k = 0, 1\}$, and chemoresponse assay outcome group l , $\{l = 0, 1\}$. The midrange is computed over $i = 1, \dots, 34$. The superscript 0 specifies the event stratum corresponding to death since disease progression. Following, $p_{32} = 1 - p_{22}$. The transition probabilities p_{22} and p_{32} in the assay adherent cohort are defined similarly, using the distribution in the last row of Table 1.