

## A Novel Calculator for Cumulative Relative Dose Intensity (cRDI) for Chemotherapy in Pancreatic cancer

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**Background/Aims:** To assess an epidemiologic relationship between chemotherapeutic dose and patients' response in population level, the relative dose intensity (RDI, %) of individual patient has to be measured accurately. We established a modified Hryniuk model (<http://www.rdicalc.com>) and defined cumulative RDI (cRDI, %). Since this algorithm has been developed first in FOLFIRINOX regimen in advanced pancreatic cancer, we updated and validated this program in another standard regimen (gemcitabine with nab-paclitaxel, GNP) in metastatic pancreatic cancer (MPC). We aimed to validate modified Hryniuk model and find the optimal relative dose intensity (RDI, %) of GNP that preserves tumor responses in population with MPC patients.

**Methods:** We reviewed 256 patients with MPC treated with first-line GNP during 2015–2018. The optimal cRDI thresholds for response rate (RR) and disease control rate (DCR) were assessed using receiver operating characteristic (ROC) analysis. Relationships between cRDI and hematologic toxicities (neutropenia [NP] and febrile neutropenia [FN]) were also analyzed according to use of granulocyte colony-stimulating factor (G-CSF).

**Results:** A total of 181 patients completed initial treatment plan prior to the first radiological evaluation (median 72 days; 84.3% cRDI). For optimal cRDI thresholds, ROC curves showed a 84.5% cRDI for RR (79.1% sensitivity, 69.5% specificity, and 0.751 area under the curve [AUC]) and a 75.9% cRDI for DCR (91.1% sensitivity, 72.2% specificity, and 0.740 AUC). Among 96 patients who did not receive prophylactic G-CSF, cRDI  $\geq$  91.5% was a significant predictor for frequent FN (81.1% sensitivity, 69.2% specificity, and 0.758 AUC).

**Conclusions:** The modified Hryniuk model was well validated in GNP regimen in metastatic pancreatic cancer population. To preserve optimal RR and DCR of GNP in MPC, cRDI values for GNP  $>85\%$  and  $>75\%$ , respectively, are recommended. If cRDI is  $>90\%$ , primary G-CSF prophylaxis is needed in this population.

