



PIC QUESTION OF THE WEEK: 10/06/08

Q: What is the Child-Pugh scoring system and how does it relate to drug dosage?

A: The Child-Turcotte scoring system was developed in 1964 to evaluate the risk of patients undergoing shunt surgery for portal decompression. This classification system was determined to possess a number of deficiencies and, in 1972, was refined by Pugh as a tool for identifying the risk of surgery in patients with bleeding esophageal varices. The Child-Pugh or Child-Turcotte-Pugh grading scale utilizes five criteria to estimate the severity of liver disease. These include serum bilirubin, serum albumin, prothrombin time (or International Normalized Ratio –INR), degree of encephalopathy, and the presence of ascites (see Table). The scoring scale allows for classifying the disease as *mild (Class A: 5-6 points)*, *moderate (Class B: 7-9 points)*, or *severe (Class C: 10-15 points)*. Class A patients are considered low surgical risks while Child-Pugh Class C patients have severe disease and generally should not undergo surgery except for liver transplantation. This scoring system is also included in the product labeling of a number of drugs (e.g. abacavir, caspofungin, argatroban, esomeprazole, ondansetron, voriconazole, etc.) that require dose modification in patients with significant liver disease. Validity of the Child-Pugh score is often questioned because evaluation of ascites and encephalopathy is relatively subjective. In addition, it may not accurately distinguish between moderate and severe disease and may have been responsible for the severe toxicity and occasional fatalities recently reported with the antineoplastic agent erlotinib (Tarceva). Although the Child-Pugh scoring system has deficiencies, its long term clinical application and ease of use make it a routine tool for assessing the severity of liver disease.

Child-Pugh Scoring System

Clinical Marker	Severity Score		
	1	2	3
Bilirubin (mg/dL)	1-2	2.1-3	≥3.1
Albumin (g/dL)	≥3.5	2.8-2.5	≤2.7
Prothrombin Time <i>Or</i> INR	1-4 <1.7	4.1-6 1.7-2.3	≥6.1 >2.3
Ascites	None	Mild	Moderate
Encephalopathy	None	1 or 2	3 or 4

References:

- Bahador A, Davari HR, Dehaghani SM, et al. Comparison of Child-Turcotte-Pugh and pediatric end-state liver disease scoring system to predict morbidity and mortality of children awaiting liver transplantation. *Transplant Proc* 2007;39:3175-77.
- Chase D, Connelly S, Sindelar R, et al. Dosage adjustment for hepatic dysfunction based on Child-Pugh scores. *Am J Health-Syst Pharm* 2007;64:691-3.
- Food and Drug Administration. MedWatch. Tarceva. <http://www.fda.gov/medwatch/safety/2008/safety08.htm#Tarceva> Accessed October 1, 2008

Photo by: Micky: used under Creative Commons License: <http://www.flickr.com/photos/emzee/259669867/> (accessed October 1, 2008)

Kristen L. Ridge and John M. Van Damia, Pharm.D. Candidates

The PIC Question of the Week is a publication of the Pharmaceutical Information Center, Mylan School of Pharmacy, Duquesne University, Pittsburgh, PA 15282 (412.396.4600).