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FAST FACTS AND CONCEPTS #189

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Background In 2004, liver failure resulted in over 26,000 deaths, making it the twelfth leading cause of death in the United States. Patients with compensated chronic liver failure (without ascites, variceal bleeding, encephalopathy, or jaundice) have a median survival of 12 years. After decompensation, median survival drops to ~ 2 years. This Fast Fact reviews prognosis in chronic liver failure, focusing on two validated prognostic indices. Of note, these indices predict prognosis for patients without liver transplantation.

The Child's-Turcotte-Pugh (CTP) score includes 5 variables, each scored 1-3:

	Numerical Value		
	None	Slight	Moderate/Severe
Ascites	None	Slight	Moderate/Severe
Encephalopathy	None	Grade 1-2	Grade 3-4
Bilirubin (mg/dL)	< 2.0	2.0-3.0	>3.0
Albumin (mg/L)	> 3.5	2.8-3.5	<2.8
Increase in seconds from normal Prothrombin time	1-3	4-6	>6.0

Patients are grouped into three classes based on the total CTP score, which is simply the sum of the scores for each of the 5 variables. Patients scoring 5-6 points are considered to have 'Class A' failure; their 1 and 2 year median survivals are 95% and 90%, respectively. A score of 7-9 is considered *Class B* with median survivals of 80% at 1 year and 70% at two years. *Class C* patients (10-15) have far greater mortality: 1-year median survival is 45% and 2-year is 38%. Variations in the timing and subjectivity inherent in the scoring of the CTP (e.g. in grading ascites or encephalopathy) are its major limitations. In addition, the scale does not include renal function, an important prognostic factor in liver failure.

The **Model for End-stage Liver Disease (MELD)** score was developed in 2000 to overcome the above-mentioned limitations and determine survival benefit from transjugular intrahepatic portosystemic shunting. It is currently used to help determine organ allocation for liver transplantation, and there is increasing evidence that it can also be used generally to predict survival in patients with chronic liver failure. The MELD score relies on laboratory values alone (serum creatinine, total bilirubin, and INR). An additional benefit over CTP is that it can predict prognosis on the order of months with more precision – making it helpful for determining hospice eligibility in the US. The formula to calculate MELD score is complex, and a calculator can be found at: <http://www.unos.org/resources/meldPeldCalculator.asp>.

MELD Score	Predicted 6 month survival	Predicted 12 month survival	Predicted 24 month survival
0-9	98%	93%	90%
10-19	92%	86%	80%
20-29	78%	71%	66%
30-39	40%	37%	33%

Other important prognostic variables The hepatorenal syndrome (HRS) – renal failure from renal arterial under-filling due to decompensated liver failure – portends a particularly poor prognosis. Most patients with type-1 HRS (rapid and severe renal failure) die within 8-10 weeks even with therapy. Median survival with type-2

HRS (chronic, less severe renal failure with serum creatinine usually 1.5-2 mg/dL) is around 6 months. Both older age and hepatocellular carcinoma also adversely affect survival. While the CTP and MELD systems provide objective guidance to prognostication in liver failure, clinical judgment, patient comorbidities, the rate of decompensation, and the likelihood of transplantation all should additionally affect the assessment and communication of a patient's prognosis in liver disease.

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