

What is the Child-Pugh score?

Prepared by UK Medicines Information ([UKMi](#)) pharmacists for NHS healthcare professionals
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Background

The Child-Pugh score (or its associated Child-Pugh grade) is often used as a means to give a very general description of the clinical state of patients with cirrhosis of the liver, and to indicate the severity of the condition. It may also appear on the manufacturer's literature with regard to dosage adjustment, or to contra-indicate the use of a drug in certain populations of patients with liver disease. For example, the Summary of Product Characteristics (SPC) for Femara® (letrozole) advises that no dose adjustment is required for patients with hepatic impairment described as Child-Pugh grade A or B, but advises close supervision in patients with Child-Pugh C (1). This Medicines Q&A will explain what these descriptions are referring to, and how it is assessed.

Answer

The Child-Pugh Score

In the 1960's a classification system was developed by Child and Turcotte to assess the likelihood of mortality in cirrhotic patients who were undergoing portosystemic shunt surgery to prevent further variceal bleeds. Each patient was assigned a Child's grading (of A, B or C) to stratify the individual with regard to risk of death due to the procedure (2). Child's grade A patients were believed to have the best prognosis, and Child's grade C patients the worst (3). This classification system was modified by Pugh in the 1970s to produce the Child-Pugh scoring system. Five variables are considered: presence of ascites, encephalopathy, serum levels of albumin, total bilirubin, and prolongation of the clotting time. Each of these variables is assigned a score between 1 and 3 according to its severity or degree of abnormality. Following modification by Pugh, the scoring system was used to predict mortality of cirrhotic patients with regard to any type of surgery (2,3). Nowadays, the Child-Pugh score is used to assess prognosis of cirrhotic patients in general (4).

Table 1: Assigning a Child-Pugh score (for an adult patient) (3,5,6,7):

Parameter	Score		
	1	2	3
Ascites	None	Mild	Moderate or Severe
Encephalopathy (grade)	None	1-2	3-4
Bilirubin (micromole/L) OR Bilirubin in Primary Biliary Cirrhosis (micromole/L)	<35 <70	35-50 70-170	>50 >170
Albumin (g/L)	>35	28-35	<28
INR	<1.7	1.8-2.3	>2.3

Some sources use prolongation of prothrombin times instead of INR (international normalised ratio) to measure the deviation in clotting. Prothrombin time has not been included in the table above, even though it is quoted in various published versions of the table, because the value (in seconds) equating to the scores 1, 2 or 3 differs between sources. This may be because prothrombin times may vary between different laboratories according to the thromboplastin used in the assay (7). The INR is a more consistent marker. Please see below for further descriptions of grading ascites and encephalopathy.

The sum of the five scores from the above table is used to assign a “Child-Pugh grade” (also known as a Child’s grade) of A, B or C to the patient’s clinical condition at that point in time. This grade is used to gauge mortality using the following table:

Table 2: Percentage survival in cirrhotic liver disease (5,7):

Child-Pugh grade	Child-Pugh Score		1 Year Survival	5 year Survival	10 year Survival
A	5-6	Indicates a well-functioning liver	84 %	44 %	27 %
B	7-9	Indicates significant functional compromise	62 %	20 %	10 %
C	10-15	Indicates decompensation of the liver	42 %	21 %	0 %

The Child-Pugh score should be reassessed periodically since the patient’s clinical condition may improve or deteriorate with time (6).

The Child-Pugh grades A, B and C are sometimes referred to in product literature (e.g. the SPC for Femara®) when discussing contra-indications or precautions (1). It is important to remember that the grading scale relates to patients with cirrhosis, and when this term is included in a SPC it is generally because the studies that support the information have been performed in cirrhotic patients. Not all patients with liver dysfunction will be cirrhotic, and there may be other issues to consider; Medicines Q&As 170 and 171 give general advice on factors to consider when prescribing drugs to patients with liver disease.

Ascites

Ascites may be graded according to the following table (please note that the grades are not identical to the score assigned when calculating the Child-Pugh score).

Table 3: Assessment of Ascites (8):

Grade	Description	Features
1	Mild	Only detectable by ultrasound examination
2	Moderate	Moderate symmetrical distension of the abdomen
3	Severe	Marked abdominal distension

Encephalopathy

Assessment of encephalopathy takes into account alterations in behaviour and mental function of the patient, and the level of consciousness (5). The various grades of hepatic encephalopathy can be assessed using the table below.

Table 4 : Assessment of encephalopathy (5):

Grade	Features	Liver Flap (asterixis)
1	Impaired higher functions (eg arithmetic) but no effect on consciousness	Usually absent
2	Disorientation and personality change with inappropriate behaviour	Usually present
3	Confusion and gross disorientation with increased somnolence	Present
4	Coma	Usually absent

Summary

The Child-Pugh score, or the Child-Pugh grade, can be used in patients with liver cirrhosis to assess the severity of the clinical condition. Five variables are considered (severity of ascites and of encephalopathy, abnormality in the serum bilirubin, serum albumin and clotting times), and a score (of between 1 and 3) is accordingly assigned to each of these factors. The sum of the scores provides the Child-Pugh score, which corresponds to a Child-Pugh grade (or Child’s grade) of A, B or C. This

grade is used as a general means to verify the prognosis of the patient. For example, it can be used to determine the risk to a patient with regard to possible surgery, and also, to suggest the perceived survival of the patient over a period of time. Pharmaceutical manufacturers may use the Child-Pugh grade to suggest dose reductions, or to contraindicate the use of the drug, dependent on the degree of dysfunction of the cirrhotic liver.

Limitations

The information in this Medicines Q&A is applicable to adults only.

References

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Quality Assurance

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Search strategy

Original search

- Embase ("child AND pugh" + exp"LIVER DISEASE")
- Medline ("child AND pugh" + exp"LIVER DISEASE")
- In-house standard and specialist liver reference sources
- British Society of Gastroenterology. Accessed via www.bsg.org.uk on 12/04/2011
- British Liver Trust. Accessed via www.britishlivertrust.org.uk/home.aspx, on 12/04/2011

Updated search

- Embase ("child AND pugh" + exp"LIVER DISEASE")
- British Society of Gastroenterology. Accessed via www.bsg.org.uk on 22/05/2017
- British Liver Trust. Accessed via www.britishlivertrust.org.uk/ on 22/05/2017

Available through Specialist Pharmacy Service at www.sps.nhs.uk