

# Maximum tumour dimension (Required)

## Reason/Evidentiary Support

Size of the tumour is an important determinant of stage and should be recorded in all cases of both HCC and CC. The maximum diameter, measured to the nearest millimeter, can be assessed both on the unfixed or fixed specimen (unfixed specimen avoids underestimation resulting from formalin fixation-induced shrinkage). For cases with multiple tumours, it has been recommended that size of at least 5 largest tumour nodules should be provided,<sup>1</sup> while a range can be expressed for additional tumour nodules.

### Hepatocellular carcinoma

Large size (>5 cm) and multiple tumour nodules are unfavorable prognostic factors for patients with HCC after hepatic resection.<sup>2,3</sup> TNM8 also uses a dimension of 2 cm to divide stage pT1 into pT1a solitary HCC <2 cm irrespective of microvascular invasion and pT1b for patients with solitary HCC >2 cm without microvascular invasion. Tumour size is associated with the pathological grade of HCC, the probability of vascular invasion, and with the prognosis of HCC patients, after potentially curative treatments such as surgical resection and medical ablation.<sup>4-7</sup> However, data on tumour size are controversial. In a recent paper by Goh et al<sup>8</sup> the number of nodules (>3) but not the size has been found an independent negative predictors of overall survival (OS). The study by Kluger et al<sup>9</sup> also demonstrated that size alone is a limited prognostic factor.

### Intrahepatic cholangiocarcinoma

Using a large multi-institutional data set, it has been noted that the prognostic importance of tumour size in intrahepatic cholangiocarcinoma has a nonlinear threshold effect on prognosis.<sup>10</sup> In another study, unifocal intrahepatic cholangiocarcinoma <2cm diameter was shown to have a superior prognosis after liver transplantation compared with larger or multifocal tumours.<sup>11</sup>

### Perihilar cholangiocarcinoma

The maximum tumour dimension is more difficult to measure for perihilar cholangiocarcinoma, since the extent of the tumour requires histological confirmation for accurate assessment. Both the linear extent of the tumour along the bile duct, and the maximum diameter of any mass lesion should be included, for correlation with pre-operative imaging.

## References

- 1 Dabbs DJ, Geisinger KR, Ruggiero F, Raab SS, Nalesnik M and Silverman JF (2004). Recommendations for the reporting of tissues removed as part of the surgical treatment of malignant liver tumors. *Hum Pathol* 35(11):1315-1323.
- 2 Vauthey JN, Lauwers GY, Esnaola NF, Do KA, Belghiti J, Mirza N, Curley SA, Ellis LM, Regimbeau JM, Rashid A, Cleary KR and Nagorney DM (2002). Simplified staging for hepatocellular carcinoma. *J Clin Oncol* 20(6):1527-1536.
- 3 Poon RT and Fan ST (2003). Evaluation of the new AJCC/UICC staging system for hepatocellular carcinoma after hepatic resection in Chinese patients. *Surg Oncol Clin N Am* 12(1):35-50, viii.
- 4 The Liver Cancer Study Group of Japan (1994). Predictive factors for long term prognosis after partial hepatectomy for patients with hepatocellular carcinoma in Japan. The Liver Cancer Study Group of Japan. *Cancer* 74(10):2772-2780.
- 5 Lencioni R, Bartolozzi C, Caramella D, Paolicchi A, Carrai M, Maltinti G, Capria A, Tafi A, Conte PF and Bevilacqua G (1995). Treatment of small hepatocellular carcinoma with percutaneous ethanol injection. Analysis of prognostic factors in 105 Western patients. *Cancer* 76(10):1737-1746.

- 6 Tateishi R, Yoshida H, Shiina S, Imamura H, Hasegawa K, Teratani T, Obi S, Sato S, Koike Y, Fujishima T, Makuuchi M and Omata M (2005). Proposal of a new prognostic model for hepatocellular carcinoma: an analysis of 403 patients. *Gut* 54(3):419-425.
- 7 Han JH, Kim DG, Na GH, Kim EY, Lee SH, Hong TH and You YK (2014). Evaluation of prognostic factors on recurrence after curative resections for hepatocellular carcinoma. *World J Gastroenterol* 20(45):17132-17140.
- 8 Goh BK, Chow PK, Teo JY, Wong JS, Chan CY, Cheow PC, Chung AY and Ooi LL (2014). Number of nodules, Child-Pugh status, margin positivity, and microvascular invasion, but not tumor size, are prognostic factors of survival after liver resection for multifocal hepatocellular carcinoma. *J Gastrointest Surg* 18(8):1477-1485.
- 9 Kluger MD, Salceda JA, Laurent A, Tayar C, Duvoux C, Decaens T, Luciani A, Van Nhieu JT, Azoulay D and Cherqui D (2014). Liver Resection For Hepatocellular Carcinoma in 313 Western Patients: Tumor Biology and Underlying Liver Rather than Tumor Size Drive Prognosis. *J Hepatol*.
- 10 Hyder O, Marques H, Pulitano C, Marsh JW, Alexandrescu S, Bauer TW, Gamblin TC, Sotiropoulos GC, Paul A, Barroso E, Clary BM, Aldrighetti L, Ferrone CR, Zhu AX, Popescu I, Gigot JF, Mentha G, Feng S and Pawlik TM (2014). A nomogram to predict long-term survival after resection for intrahepatic cholangiocarcinoma: an Eastern and Western experience. *JAMA Surg* 149(5):432-438.
- 11 Sapisochin G, Rodriguez de Lope C, Gastaca M, Ortiz de Urbina J, Suarez MA, Santoyo J, Castroagudin JF, Varo E, Lopez-Andujar R, Palacios F, Sanchez Antolin G, Perez B, Guibertau A, Blanco G, Gonzalez-Dieguez ML, Rodriguez M, Varona MA, Barrera MA, Fundora Y, Ferron JA, Ramos E, Fabregat J, Ciria R, Rufian S, Otero A, Vazquez MA, Pons JA, Parrilla P, Zozaya G, Herrero JI, Charco R and Bruix J (2014). "Very early" intrahepatic cholangiocarcinoma in cirrhotic patients: should liver transplantation be reconsidered in these patients? *Am J Transplant* 14(3):660-667.