educate and prepare head and neck cancer patients for upcoming surgery where mandibulectomy is part of the surgical procedure. This has been used to educate three consecutive patients.

**Methods and Materials:** For each patient, detailed anatomy of the mandible was obtained via CT images which were already available for patient staging and treatment. Images were segmented (3D Doctor, Able Software) and the resulting model was exported as an STL file to software controlling the printer (Repetier-Host), converted to gcode (Slic3r) and printed on a consumer-Grade 3D printer (MakerGear, M2). To improve quality, a slow print speed of about 30 mm/second was used. A layer thickness of 0.3 mm resulted in reasonable print times.

**Results:** We were able to create a precise and detailed life-size model of the patient’s mandible for three patients. Each model included minute normal anatomy as well as the defect created by the tumour.

The surgeon involved was able to use the models during clinical visits to educate the patients. He was also able to show his plan to perform a mandibulectomy to fully remove the tumour and surrounding healthy bone. He was also able to show the supportive, metal reconstruction plate which would be necessary to fit on the mandible. In these cases, each patient was able to give suggestions based on personal preferences and their new understanding of the anatomy displayed on the model. This resulted in a decrease in patient anxiety. It also led to a modest change in surgical planning and management. The models were subsequently used to customize the reconstructive plates.

**Conclusions:** The use of 3D printing technology to create precise anatomic models in order to educate patients is a novel and promising approach. When patients are able to visualize their own anatomy and the anatomy of an invading tumour, it allows them to be more involved in their own care. There is a decrease in anxiety and in some instances, it can even lead to technical changes in management. Although 3D printing has already been used to save valuable operating room time and in the medical education of other health care professionals, we found that it can be effectively used as a valuable, patient education tool.

219 EFFECT OF RADIOACTIVE IODINE DOSING ON DISEASE RECURRENCE IN DIFFERENTIATED THYROID CANCER
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**Purpose:** Radioactive iodine (RAI) dose for early differentiated thyroid cancer (DTC) has decreased from 100mCi to 30mCi. There is little long-term data to determine the effect, if any, on disease recurrence. Our analysis aims to identify clinicopathologic factors associated with disease recurrence in DTC.

**Methods and Materials:** For each patient, thyroid scans were eligible for analysis. We identified 219 patients diagnosed between 1996 and 2008 with Stage I-II DTC (papillary and follicular) who had follow-up for five years with ultrasound, thyroglobulin, and whole body thyroid scans. We stratified patients into two groups by initial RAI dose (≤ 50 mCi versus > 50 mCi). Recurrence was defined as an elevated stimulated thyroglobulin (biochemical recurrence) or biopsy-proven disease. Test for significant differences between the survival and relapse curves were done using the log-rank test. Survival and relapse curves were calculated using the Kaplan-Meier method.

**Results:** A greater proportion of patients in the high dose RAI group had extrathyroidal extension (ETE) (52.0% versus 24.8%, p = 0.001). Groups did not differ otherwise in baseline characteristics. Patients who recurred more frequently had ETE (43.7% versus 21.9%, p = 0.003) and lymph node (LN) metastases (74.7% versus 38.3%, p < 0.001) at diagnosis. Tumour size, multifocality, vascular invasion, patient age and gender did not predict for recurrence. On multivariate analysis, LN metastases at diagnosis predicted for local and distant recurrence (HR 2.67, 1.17-6.05). Female gender (HR 4.08, 1.04-16.05) and initial dose ≤ 50 mCi (HR 6.30, 1.30-30.55) predicted for local recurrence. Median time to recurrence was shorter in patients receiving an initial dose ≤ 50 mCi (23.2 versus 47.6 months, p < 0.001). Median survival time did not differ between dose groups (105.8 versus 114.1 months, p = 0.773). On multivariate analysis, patients treated with initial dose ≤ 50 mCi who had ETE and LN metastases at diagnosis were more likely to recur (p = 0.004). Patients with both risk factors had a median time to recurrence of 25.2 months (≤ 50 mCi) versus 120.9 months (> 50 mCi), p = 0.04.

**Conclusions:** Patients treated with ≤ 50 mCi had a significantly shorter mean time to disease recurrence. In patients treated with > 50 mCi, ETE and lymph node metastases at diagnosis predicted for recurrence. Patients presenting with these risk factors may require an initial RAI dose > 50 mCi. Further analyses are required to confirm these findings.