Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

carried out (EBT3 film, Epsom V850 Pro scanner) in an antropomorphic phantom. Gamma analysis was carried out using dose difference/distance to agreement of 3%3mm, 3%2mm, 3%1mm and 5%1mm. The failure modes were recorded.

Results
The pass rates were 4-15% greater for PD than for O/V, with the difference being greatest for the analyses with finer spatial resolution, and the standard deviation was greater (table 1).
The measured and calculated profiles agreed very well in general with portal dosimetry (fig 1B) while for Octavius, the measured profiles in general were less modulated than the calculated (1A, red arrows).
The doses measured with film were smaller than the calculated doses by up to 15%, and this difference varied throughout the phantom.

		3% 3mm	3% 2mm	3% 1mm	5% 1mm
Octavius/Verisoft (O/V)	Mean	95.48	91.43	81.46	92.31
	St. dev.	6.85	5.63	8.52	4.92
Portal dosimetry (PD)	Mean	99.46	98.98	95.89	99.36
	St. dev.	0.60	1.17	3.47	1.11
Difference in mean pass rate (PD vs O/V) (%)		4.01	7.63	15.04	7.10

Table 1 Gamma pass rates for Octavius/ Verisoft and Portal Dosimetry for 10 patients

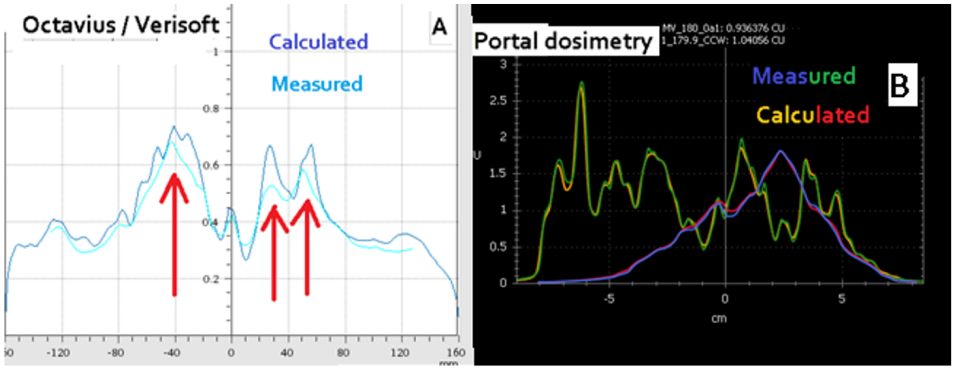

Figure 1 Calculated and measured profiles for Octavius (A) and Portal dosimetry (B)

Conclusion
The patient specific quality assurance systems indicate quite different trends, with the Octavius measurements showing lower pass rates and less modulation than the calculated dose distributions. Further work with high resolution detectors is required to fully explore the accuracy of the delivered doses for patients with multiple metastases.

PO-1561 Low Dose Radiation Therapy for COVID-19 Pneumonia: Risk of Cancer with AP-PA fields and IMRT

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Purpose or Objective
Low dose radiation therapy (LDRT) to lungs has shown encouraging results in patients with Covid-19 pneumonia. Though the prescribed dose of LDRT is very low (0.5-1.5 Gy), but there has been some concern regarding the risk of radiation induced carcinogenesis (RIC). Risk is dependent on the amount of radiation exposure and the age at exposure. Most LDRT trials have used conventional AP-PA open fields. Modern technique like IMRT can potentially reduce the organs at risk (OAR) doses thereby minimizing the risk of RIC. We designed a dosimetric study to see if IMRT can reduce the dose to OARs and lessen the risk of RIC in Covid-19 patients.

Materials and Methods
We retrieved the CT scan data of 10 patients who have been already treated for any malignancy in the region of thorax. The following selection criteria were used 1) Age >40 years 2) equal number of male and female patient so as to estimate the risk of RIC in breast 3) no previous surgery in the thoracic area and intact thoracic organs and breast 4) complete set of CT imaging from mandible to L1vertebra. The CT data of each patient was used to delineate the CTV and OAR to generate two parallel plans: one with open fields (Conventional Plan) and one with VMAT. A dose of 1 Gy in single fraction was prescribed to PTV which included both lungs. Mean OAR doses were used to estimate the risk of RIC for both plans and compared. The excess relative risk (ERR) of RIC was estimated using online radiation risk assessment calculator (https://irep.nci.nih.gov/radrat). This tool (RadRT) uses the risk models broadly based on Biological Effects of Ionizing Radiation (BEIR) VII with some modifications. The ERR values the two plans were compared. For statistical analysis, two

tailed Wilcoxon signed rank test was used to compare the dosimetry and ERR between two planning techniques. A p-value of <0.05 was considered significant.

Results
The beam-on time and monitor units (MU) were less with conventional plan but all other DVH parameters (D_{95}, D_{mean}, CI and HI) were significantly better with VMAT (p value <0.05 for all). Mean dose to most OAR like esophagus, spinal cord, thyroid and skin was significantly lower with VMAT (p value <0.05 for all). Mean heart dose with conventional plan was not only higher than VMAT plan (<0.05) but also crossed the prescribed dose. Table 1 shows the comparison of ERR in both the plans. The overall ERR is significantly lower with VMAT as compared to conventional plan (0.357 vs 0.398%, p value <0.05). The ERR for all individual organs except thyroid was significantly lower with VMAT. Even though the mean thyroid dose was significantly less with VMAT than conventional plan, but the ERR for thyroid cancer was comparable with two plans. ERR was significantly less with VMAT. In both plans, the ER

Table 1: Comparison of excess life time risk of cancer in different organs with Conventional and VMAT plan.

Excess life time risk (%)					
Site	Conventional		VMAT		p value
	Median	Range	Median	Range	
Overall risk	0.398	0.194-0.621	0.3575	0.16-0.528	<0.05
Lung	0.2835	0.104-0.339	0.27	0.0965-0.316	<0.05
Esophagus	0.01155	0.00411-0.0277	0.009	0.00365-0.0236	<0.05
Spinal cord	0.004065	0.000754-0.0217	0.003348	0.000281-0.0101	<0.05
Marrow	0.0659	0.039-0.0737	0.04765	0.0188-0.0539	<0.05
Thyroid	0.00256	0.0000062-0.0421	0.002065	0.0000068-0.0192	N.S
Breast	0.0747	0.0214-0.184	0.0579	0.0161-0.169	<0.05

VMAT = volumetric modulated arc therapy

R

was highest for lung followed by breast and marrow.

Conclusion
Our dosimetric study shows that IMRT can lessen the risk of RIC in Covid-19 patients undergoing LDRT.

PO-1562 Should we delineate brachial plexus in case of breast cancer hypofractionated radiotherapy?

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Purpose or Objective
Hypofractionated radiotherapy (HRT) is becoming a valid option in the treatment of breast cancer. However, data are missing concerning the normal tissues dosimetric constraints. **The purpose** of this study is to evaluate the cumulative doses in the brachial plexus during hypofractionated locoregional irradiation for breast cancer with a clinical toxicities correlation in order to propose dosimetric constraints adapted to this type of fractionation.

Materials and Methods
This is a retrospective study analyzing the dosimetric plans of 41 patients treated with adjuvant locoregional radiotherapy for localized breast cancer between January and December 2020. The treatment plan was carried out according to a three dimensional (3D) conformational technique. The dose prescribed was 42.5 Gy in 16 fractions with a boost of 10 Gy in 4 fractions in the tumor bed in case of a conservative treatment (35%) and 40 Gy in 15 fractions in case of a radical treatment (65%) at a rate of 5 fractions per week. The delineation of the brachial plexus was performed according to the RTOG guidelines and approved by two radiotherapy physicians. By analyzing the dose-volume histogram, we retrospectively recorded the mean dose (Dmean), the maximum dose (Dmax), the volume receiving more than: 32 Gy (V32) and 41 Gy (V41).These dosimetric constraint levels were defined by calculating the biological equivalent dose. Clinical assessment of radiation-induced brachial plexitis was performed at 12 months after the end of radiotherapy using a questionnaire based on the modified LENTA-SOMA clinical scales. Data analysis was performed by SPSS version 20.

Results
The median of the Dmean, Dmax, V32 and V41 were respectively of 31Gy [14-41], 41 Gy [4.5-41], 73% [0-91] and 0.08% [0-80]. The 3rd quartile (Q3) of Dmean, Dmax, V32 and V41 were respectively of 34 Gy, 43 Gy, 80% and 23%.