

**PERBANDINGAN DOSIS SERAP BOLUS BERBAHAN PLASTISIN  
DENGAN BOLUS BERBAHAN *SILICONE RUBBER*  
PADA KASUS KANKER DI PERMUKAAN**

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**ABSTRAK**

Pada kanker permukaan, dosis maksimum didapatkan jauh dari posisi kanker permukaan sebagai target terapi, sehingga dibutuhkan bolus untuk meningkatkan dosis hingga ke permukaan. Telah dibuat bolus berbahan plastisin dan *silicone rubber* dengan variasi ketebalan untuk mendapatkan perbandingan nilai *Relative Electron Density* (RED) dan dosis serap. Nilai RED diperoleh dari citra tomografi bolus menggunakan CT-Simulator dengan menentukan *Region Of Interest* (ROI). Nilai dosis serap didapatkan dengan melakukan penyinaran menggunakan energi 9 MeV dan 12 MeV. Hasil dosis serap dibaca pada elektrometer dan dianalisis secara statistik dengan *Analysis of Variance* (ANOVA). Nilai RED bolus plastisin untuk ketebalan 0,5 cm sebesar 0,837 g/cm<sup>3</sup>, ketebalan 1 cm sebesar 1,011 g/cm<sup>3</sup>, ketebalan 1,5 cm sebesar 1,06 g/cm<sup>3</sup>, dan ketebalan 2 cm sebesar 1,072 g/cm<sup>3</sup>, sedangkan bolus *silicone rubber* ketebalan 0,5 cm sebesar 1,146 g/cm<sup>3</sup>, ketebalan 1 cm sebesar 1,151 g/cm<sup>3</sup>, ketebalan 1,5 cm sebesar 1,170 g/cm<sup>3</sup>, dan ketebalan 2 cm sebesar 1,193 g/cm<sup>3</sup>. Nilai RED bolus *silicone rubber* dan plastisin memiliki kesesuaian dengan RED jaringan. Bolus *silicone rubber* dilihat dari nilai dosis serap yang diperoleh lebih efektif dibandingkan bolus plastisin karena lebih dapat mengurangi jangkauan dosis serap pada kedalaman.

Kata Kunci: ANOVA, bolus, *Linear Accelerator* (LINAC), *Relative Electron Density* (RED), *Region Of Interest* (ROI), *silicone rubber*

## COMPARISON OF ABSORBED DOSE OF PLASTISIN BOLUS WITH SILICONE RUBBER BOLUSES IN SURFACE CANCER CASE

### ABSTRACT

In surface cancer, the maximum dose is obtained far from the position of the surface cancer as a therapeutic target, so a bolus is needed to increase the dose to the surface. A bolus made of plasticine and silicone rubber with various thicknesses has been made to get a comparison of the Relative Electron Density (RED) value and the absorbed dose. The RED value is obtained from the bolus tomography image using a CT-Simulator by determining the Region Of Interest (ROI). The absorbed dose value was obtained by irradiating using 9 MeV and 12 MeV energy. The results of the absorbed dose were read on the electrometer and statistically analyzed by Analysis of Variance (ANOVA). The RED value of plasticine bolus for 0.5 cm thickness is 0.837 g/cm<sup>3</sup>, 1 cm thickness is 1.011 g/cm<sup>3</sup>, 1.5 cm thickness is 1.06 g/cm<sup>3</sup>, and 2 cm thickness is 1.072 g/cm<sup>3</sup>, while the bolus silicone rubber 0.5 cm thickness is 1.146 g/cm<sup>3</sup>, 1 cm thickness is 1.151 g/cm<sup>3</sup>, 1.5 cm thickness is 1.170 g/cm<sup>3</sup>, and 2 cm thickness is 1.193 g/cm<sup>3</sup>. The RED values of the silicone rubber and plasticine boluses corresponded to the tissue RED. Silicone rubber bolus seen from the absorption dose value obtained is more effective than plasticine bolus because it can reduce the absorption dose range at depth.

Keywords: ANOVA, bolus, Linear Accelerator (LINAC), Relative Electron Density (RED), Region Of Interest (ROI), silicone rubber

