Purpose:In order to find treatment time prior to the calculation since tomotherapy takes very long time for calculation and checking quality assurance on input parameters like modulation factor, field size, pitch experimentally.

Methods:Cheese phantom was scanned and the target, organ at risk(inner circle and outer ring) were delineated concentrically. The target was sandwiched between OAR(organ at risk) and calculated the gantry rotation time and treatment time for various input parameters modulation factor(M), pitch(P) and field size(fs). Experimentally verified all these input parameters from the gantry speed and treatment time. The relation of dR/dT(rotation time/treatment time) against pitch and dM/dR(mod factor/rotation) against pitch were verified. Moreover by evaluating constancy c in the formula D = c Dr R/(PM) helps to calculating treatment time prior to planning in order to know the time in advance.

Results:The field size verification from the graph dR/dT against pitch was done and obtained experimentally 2.52, 1.15, 4.97 for the field sizes set at the beginning of the experiment 2.48, 1 and 5. dM/dR with respect to pitch also verified which shows smooth power fit. The constancy c value obtained when gantry rotation speed saturates at 15s at the pitch value 0.143. Further decrease in pitch only alters treatment time, not the gantry speed. When R and t are constant and c is linearly proportional to M and P by referring above formula. If we evaluate experimentally the second order partial differentiation of c with respect to modulation factor and pitch, is given by 0.0151. The c is given by when rotation period is more than15s is 0.008=M*P*0.0151 and c varies when speed attains 15 according M and P variation.

Conclusions:The quality assurance of input parameters can be assured. Calculation sheet was developed for particular thickness by knowing c and will vary if gantry speed attains constant.

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I am working as Medical Physicist in Kuwait Cancer Control Center. I worked this project by taking interest and spent my money for everything, boarding and lodging. I am very much thankful to Dr. Anil Sharma who has helped me in this project. I can work any sort of Medical Physics project.