Calculation of dose distribution in PET/CT unit using MCNPX Monte Carlo code
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• Number of cancer patients has increased repeatedly over the last 10 years and the new reported cases were exceeded 12000 cases across Saudi in 2007 [1].
• Currently the number of PET and PET/CT facilities is limited and this can result in lack of access in certain regions and/or in unfavourable patient waiting lists.
• PET/CT facilities concentrated at 2 regions which are central and eastern area.
• There is a plan for building three PET/CT units in the western region.
• Most of the PET/CT facilities in Saudi consist of 3 injection room as most and one hot-WC.
• Workflow is inconvenient for staff members and patients (female).
• It is highly recommended by patients as well as staff members that we have a separate uptake unit for male and female. That could lead to reduce the occupancy of the unit which will affect our throughput aim.

• The average dose in the control room is 3.74e-5 mSv/h with relative error 0.03 and the average dose along the corridor is 3.81e-5 mSv/h with relative error 0.04. Both average dose rate are less than the individual dose p.a.

The design matches the culture morals in our society, without reducing the occupancy of the unit.
• The design accommodates future expansion (adding another PET/CT Scanner, mobile PET/CT facility, without any additional constriction works), however, the simulation excluded the extension unit.
• The design aims to simultaneously serve both female and male patients without interrupting workflow.
• Staff doses can be maintained below the classification level (6 mSv p.a.).