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Cost Optimisation in PET/CT Scanning

Dr. Frederik Giesel
Member of the Editorial Board
IMAGING
******@***dkfz-heidelberg.de

Senior Managing Consultant -
Department of Nuclear Medicine,
University Hospital Heidelberg

PET/CT scanning is a diagnostic method that enjoys increasing acceptance both in the scientific world and among practitioners. Its value derives from the increased quality of examinations compared to classical imaging methods. PET/CT scanning is, however, rather cost-intensive, which has curbed adoption of the method.

Cost efficiency is one of the main criteria for public healthcare systems when adopting a new method. Now that the diagnostic proof of concept is established, it is a key to optimise cost efficiency to maximize the healthcare-economic benefit of PET/CT. Only when it becomes clear that costs are reduced to a minimum can it be expected that health insurance organisations step in with a reliable rebate scheme.

Cost Categories

The overall cost of a PET/CT examination can be analysed in three categories: fixed costs, quasi-fixed costs and marginal costs.

• Fixed costs comprise the PET/CT device itself which has a fixed price (purchase / lease) no matter the utilisation, rent of premises and personnel employed independent from the number of examinations actually conducted.

• Quasi-fixed costs comprise items which are widely fixed but vary with the utilisation of the device. Power, for example, is widely fixed as the PET/CT device has to be run all the time. Further, peak power consumption occurs with every examination.

• True marginal costs occur only in examinations with contrast enhancement, markers and other equipment.

Using tracers like FDG is particularly interesting as they degrade during the day and thus the marginal costs per examination depend on the time of the day. This aspect is further analysed below.

Marginal Costs of FDG

FDG is used as a tracer in PET/CT to detect lesions. Each patient receives a dose of FDG upon examination. Thus, the cost for FDG is marginal per PET/CT examination. However, FDG is delivered to healthcare facilities once a day and degrades over the storage period. The degradation process is rather quick; the half-life of FDG is 110 minutes. In Germany, the cost of FDG is 30 cents per MBQ.

Assuming a dose of 350 MBQ per patient yields initial costs € 105 which increase over time as follows: Assuming a PET/CT device can be used to examine eight patients a day (i.e. one hour per patient starting immediately upon delivery of the FDG) yields total FDG costs of €3,938 per day. These comprise €105 for the very first examination and €1,260 for the last examination, the average cost per examination being €492. As FDG degrades a higher amount has to be purchased for late examinations so that enough MBQ is left after the degrading process. This makes late examinations more costly than early ones. This effect also has to be kept in mind when analysing the effect of patients arriving late or even not showing up.

By contrast if the facility runs two PET/CT devices and thus can examine the eight patients as before in half a day this reduces the cost for FDG significantly. The first two (parallel) examinations again will cost €105 each. The last two examinations will only cost €315 each. This yields an average cost for FDG of €97 per patient, provided all eight patients can be treated within the first four hours. This is only 40% of the original cost and ensures savings of €2,360 per day (€295 per patient). Assuming 200 workdays per year this yields annual savings of €47,200 per year for FDG.

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Conclusion

When optimising the cost of PET/CT such saving potential has to be kept in mind. Considering the significant potential savings on an annual basis it would be worthwhile to further examine the option to establish clusters for PET/CT which ran several PET/CT devices but potentially only on a part-time basis. PET/CT scanning is a diagnostic method that enjoys increasing acceptance both in the scientific world and among practitioners. Its value derives from the increased quality of examinations compared to classical imaging methods. PET/CT scanning is, however, rather cost-intensive, which has curbed adoption of the method. Cost efficiency is one of the main criteria for public healthcare systems when adopting a new method. Now that the diagnostic proof of concept is established, it is a key to optimise cost efficiency to maximize the healthcare-economic benefit of PET/CT. Only when it becomes clear that costs are reduced to a minimum can it be expected that health insurance organisations step in with a reliable rebate scheme.

PD Dr. Frederik L. Giesel, is in University Hospital, Heidelberg, Germany
f.giesel@dkfz-heidelberg.de

Philipp Herold is in University Hospital, Heidelberg,Germany

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