Identifying the potential of changes to blood sample logistics using simulation - DTU Orbit (17/12/2018)

Using simulation as an approach to display and improve internal logistics at hospitals has great potential. This study shows how a simulation model displaying the morning blood-taking round at a Danish public hospital can be developed and utilized with the aim of improving the logistics. The focus of the simulation was to evaluate changes made to the transportation of blood samples between wards and the laboratory. The average- (AWT) and maximum waiting time (MWT) from a blood sample was drawn at the ward until it was received at the laboratory, and the distribution of arrivals of blood samples in the laboratory were used as the evaluation criteria. Four different scenarios were tested and compared with the current approach: (1) Using AGVs (mobile robots), (2) using a pneumatic tube system, (3) using porters that are called upon, or (4) using porters that come to the wards every 45 minutes. Furthermore, each of the scenarios was tested in terms of what amount of resources would give the optimal result. The simulations showed a big improvement potential in implementing a new technology/mean for transporting the blood samples. The pneumatic tube system showed the biggest potential lowering the AWT and MWT with approx. 36% and 18%, respectively. Additionally, all of the scenarios had a more even distribution of arrivals except for porters coming to the wards every 45 min. As a consequence of the results obtained in the study, the hospital decided to implement a pneumatic tube system.

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