



## Service Priorities and Programmes Electronic Presentations

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### **On-call Scheduling of Medical Staff with a Spreadsheet Software**

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On-call scheduling

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#### **Introduction**

Creation of an on-call schedule of the medical staff involves repeated testing and calculations. The on-call schedule should comply with constraints related to the workload and holidays of individual staff member, and maintain fairness among staff members. On-call scheduling can be time-consuming, depending on the complexity of the structure of the on-call team.

#### **Objectives**

To develop a simple, efficient, and fair computer-assisted method of on-call scheduling of medical staff of a clinical department.

#### **Methodology**

We created a spreadsheet document using Microsoft Excel and OpenSolver, which was an open-source mathematical optimisation program. After the constraint parameters of the on-call schedule such as the holidays of each staff member were entered, the on-call schedule of each grade of staff was calculated sequentially using built-in Excel formulae in the worksheets and OpenSolver. The result was summarized automatically in the format identical to the published on-call schedule of our department.

#### **Result**

Data simulating the structure of the on-call team of our department was entered. The spreadsheet was able to create a feasible solution within a few seconds after data entry. The constraint parameters were fulfilled upon manual inspection. The on-call schedule could be easily modified if the constraint parameters had been changed after creation of the schedule. The spreadsheet could be modified for the use of other clinical departments by staff members with basic knowledge of Excel formulae. Knowledge of computer programming languages was not required. If no feasible solution was found, the entered constraint parameters could be inspected and

modified. Microsoft Excel is available in computers of the department, while the optimisation program is available for free. No additional cost in purchasing new software is needed. Limitation of the method included the inability to create alternative feasible arrangements of the on-call schedule when they exist. Continuous testing of the method and manual review of result is recommended.