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Improving the efficiency of Electroencephalogram (EEG) data transfer

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AIM

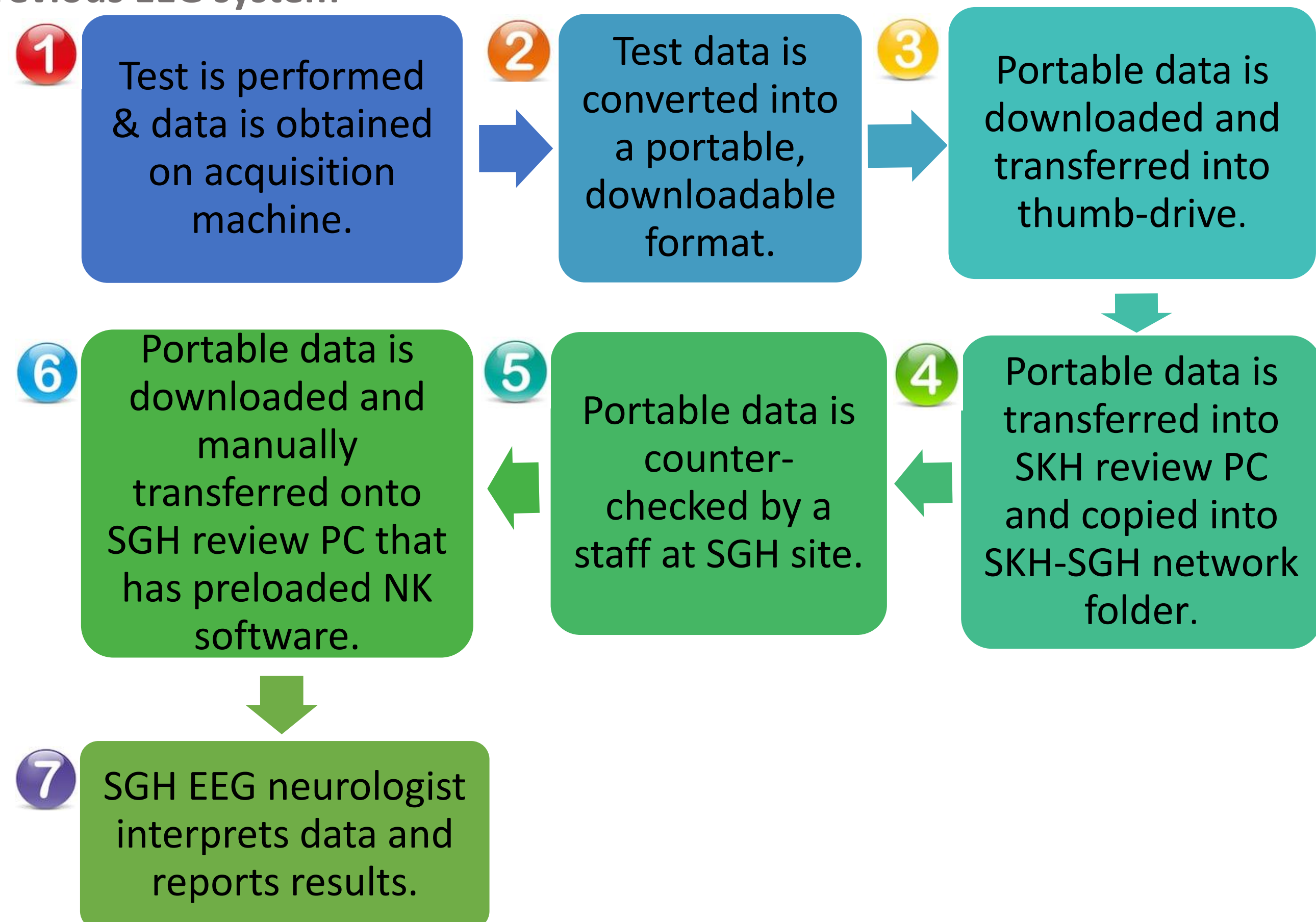
To improve on the efficiency of EEG data transfer from acquisition machine to networked computer for data reporting between Sengkang General Hospital (SKH) and Singapore General Hospital (SGH).

BACKGROUND

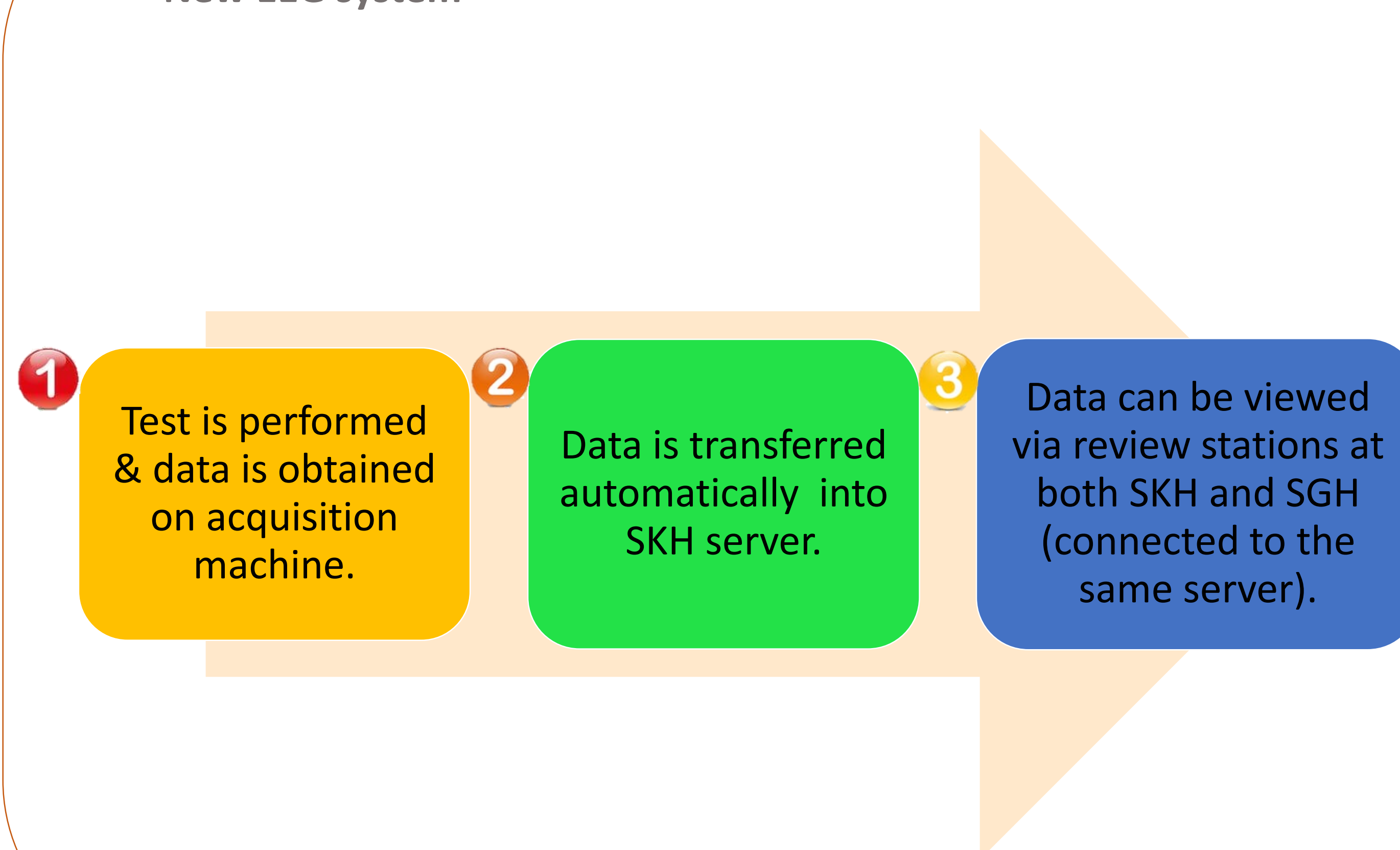
EEG machine (Nihon Kohden, EEG-1200K with Neuroworkbench) is used to conduct EEG test, which is a brain function test that records the brain waves activity, commonly used to detect brain abnormalities. The raw data produced upon completion of each test will then be transferred onto SKH hospital server, allowing EEG neurologists to do interpretation and reporting at SGH (off-site of SKH). With the previous practice, EEG raw data is required to be transferred manually from the acquisition machine using a thumb-drive to the review station, which contains a network folder accessible by SKH and SGH. EEG neurologists reporting from SGH will access the SKH EEG raw data in the network folder to do interpretation and reporting of results. This process of data transferring is time consuming, involving multiple parties to counter-check before actual reporting could be done, allowing room for errors to occur. The new system and workflow provides direct connection from the acquisition machine to SKH hospital server, and patient's EEG raw data could be automatically transferred onto the server upon the completion of test. This would help in reducing many of the steps which were previously required.

METHODOLOGY

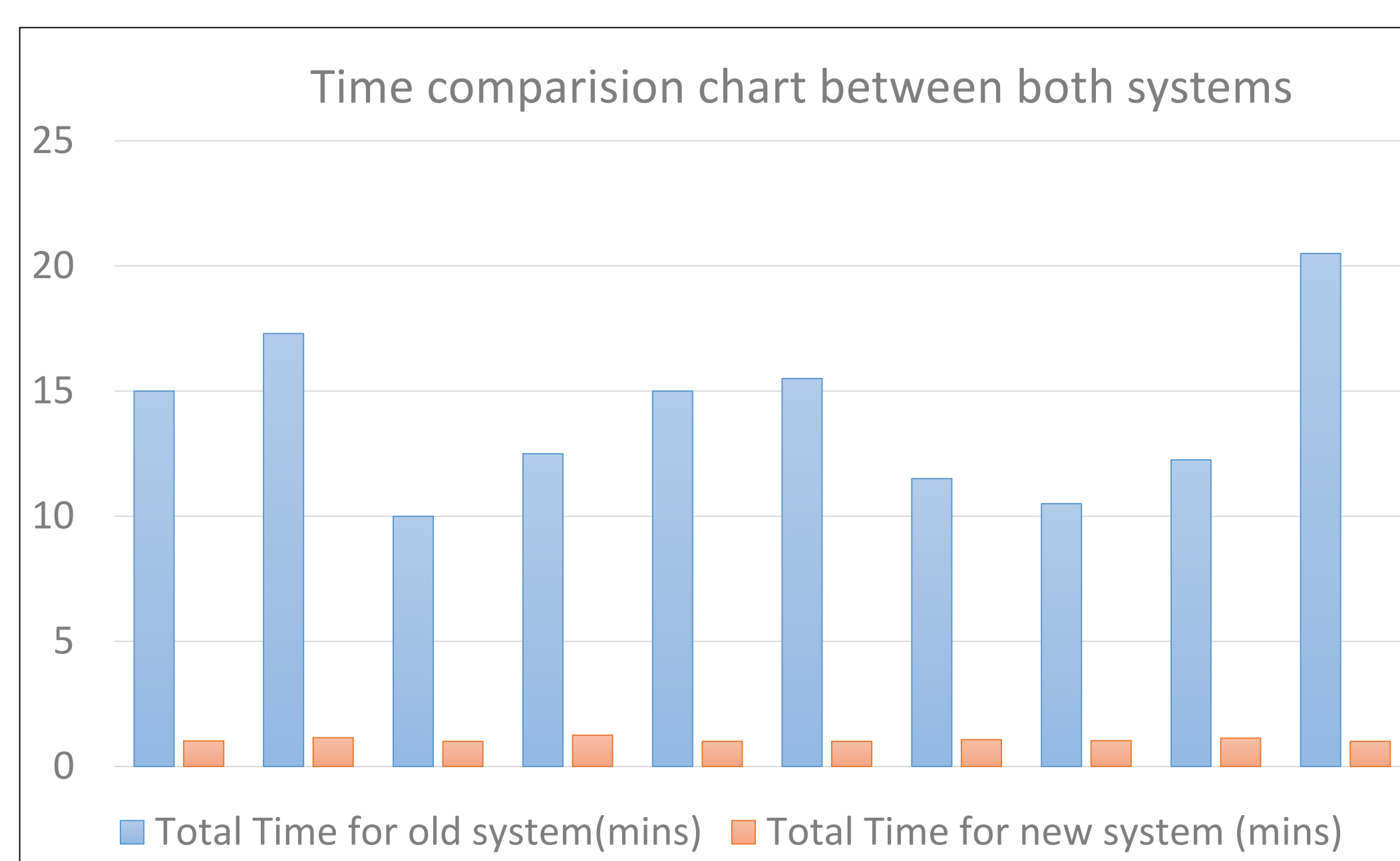
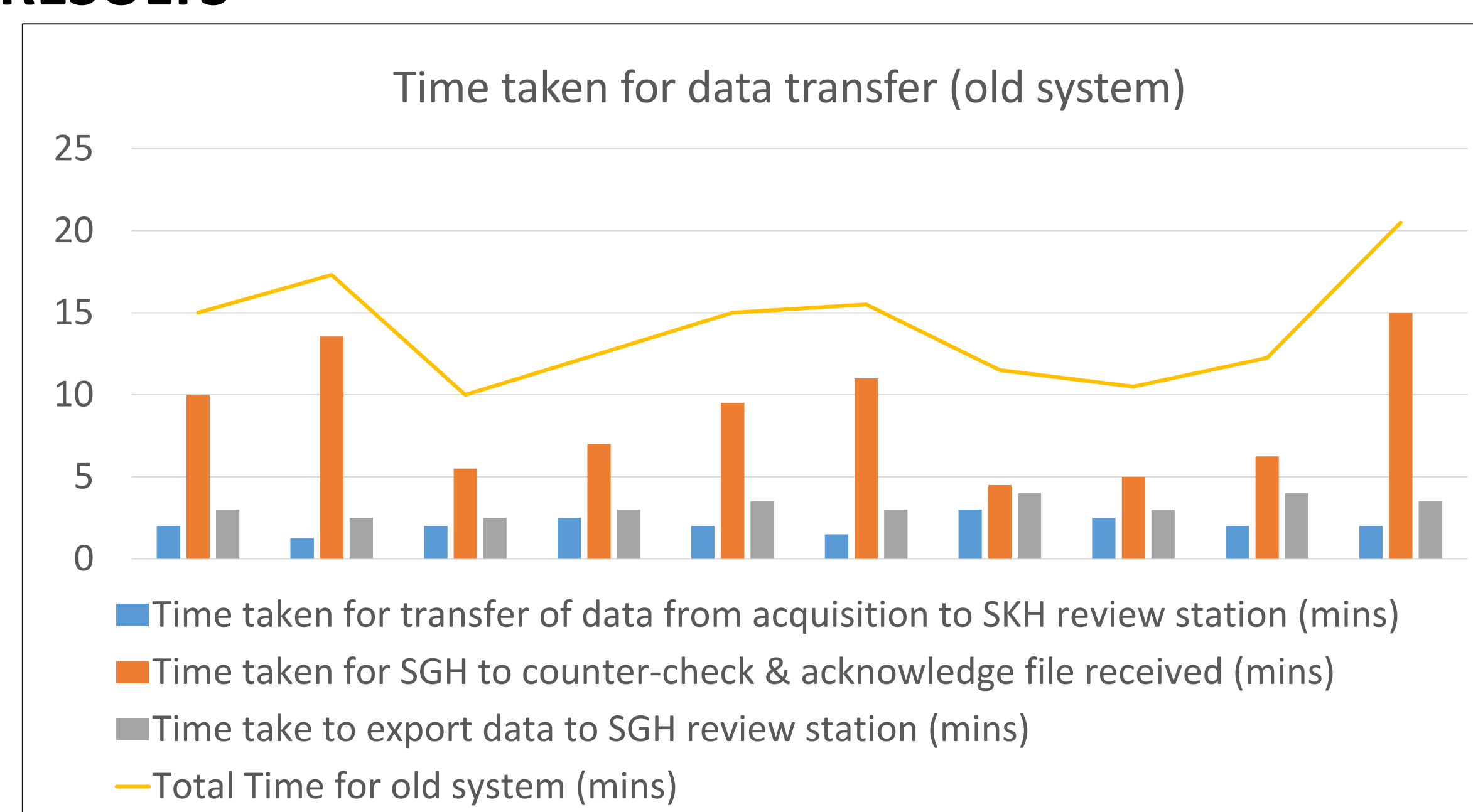
Previous EEG system



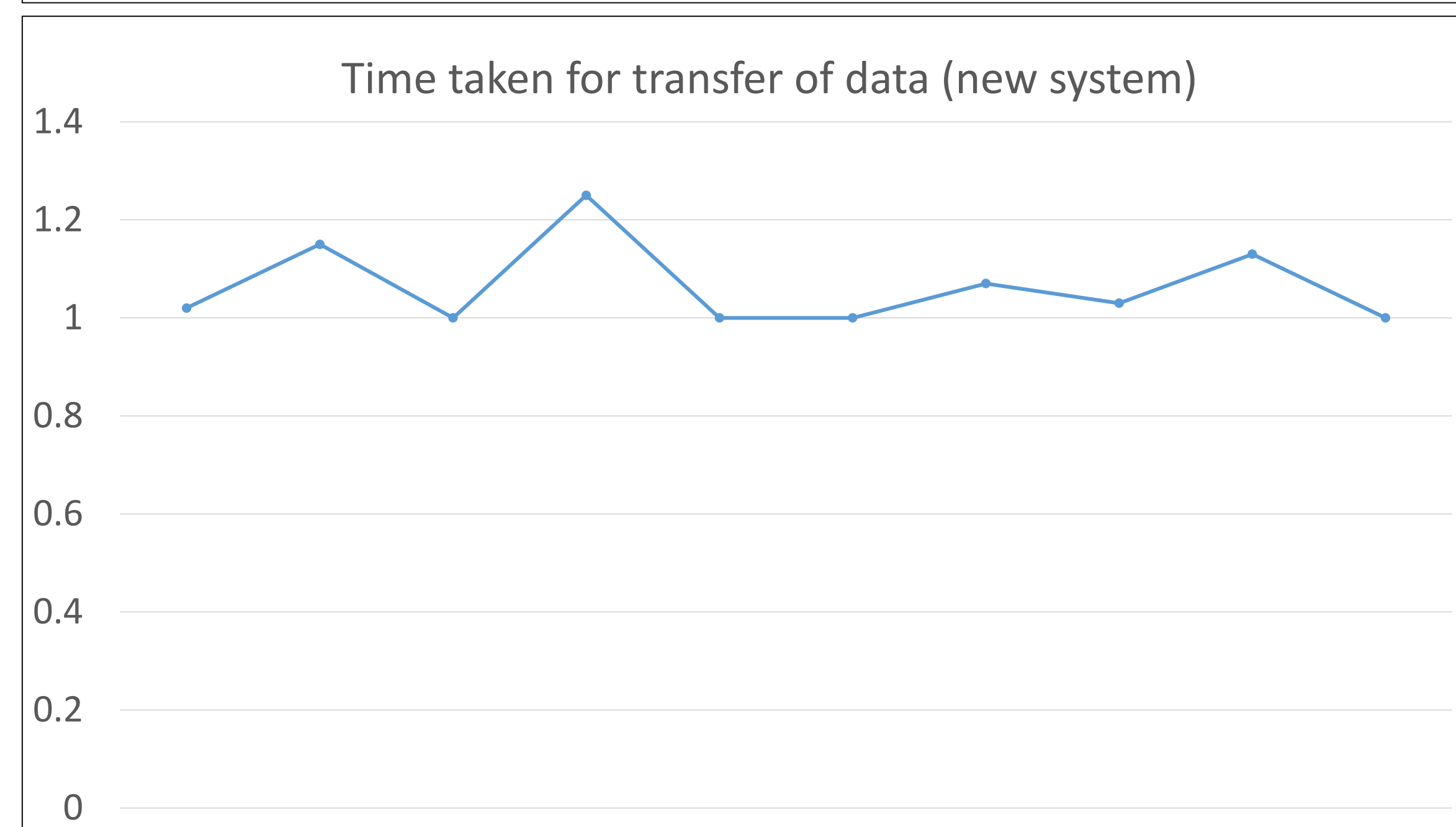
New EEG system



RESULTS



| System | Average Time Taken Per Test (minutes) |
|--------|---------------------------------------|
| Old | 14.0 |
| New | 1.1 |



- Average time required for data transfer process to be completed using the old system is approximately 14 minutes per test.
- Average time required for data transfer using the new system is approximately 1.1 minutes, resulting in **time savings of 12.9 minutes per test (92% improvement)**.
- Productivity is expected to **increase by 2 cases per EEG machine per day** with these time-savings.

DISCUSSION & CONCLUSION

The new EEG system shows a significant reduction (92%) in time required for data transfer to be completed, as compared to the previous system. This could be due to the reduction in the number of steps required, as the new system is directly connected to SKH hospital server, and does not require a third party to check and manually transfer the data over at SGH, which was one of the main contributing factor as to why the old system would require more time. By reducing the need for counter-checking and manually transferring the data, the new system is not subjected to the availability of SGH staff to verify receipt of the test data via network folder. It also eliminates the need to transfer using a secondary device (i.e. thumb-drive/ encrypted hard-disk), thus reduces the risk for human error such as the transference of wrong patient data or incomplete file transference. Overall, with the new system in place, it allows for a faster turnaround time for the analysis and reporting of EEG results by the neurologist and the time-savings can be translated to an increase in productivity of 2 additional cases per EEG machine per day.

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