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Q1.

Ans. - To properly analyse a patient, we need data that is continuous without gaps. This requires continuous monitoring of the patient using a remote monitoring device. One of the biggest challenges when it comes to continuous monitoring is power consumption and connectivity. Effective power management is required to optimise power usage so as to run the device as long as possible and also as effectively as possible. This requires scheduling the device/sensors sleep cycle so that the data collected is not excessive but necessary. Suitable connection is required to establish a link between the device and the gateway so that the data collected reaches the proper destination. Based on the data, factors such as size and distance, determine the type of connection to be used.

- The next step is to store the data collected. Some sensors transmit data that is not entirely useful. That is only part of the data is actually crucial and will be used to analyse the patient's health. To analyse and filter only the crucial information we require processing. This processing can be done on-device or off the device based on the size and complexity of the data. It is usually advised to process big data before transmitting it as it not only saves space but also energy and time. But sometimes, to process complex data, high computing is required, in such a case, processing after transmission is the viable option.
- Following storage is analysis and action, based on the collected data, after analysis, certain actions have to be implemented. This may involve ML techniques where a computer decides the next course of action. To recommend the best action, the trained model should be efficient. To achieve this efficiency, proper model construction and data is required. This means that data quality and data size is important, based on which the model is trained. A well-trained model may possibly intervene an emergency situation by suggesting a precautionary measure that puts the patient out of risk.
- Measuring the effect of the suggested action/treatment would be the next step. This again involves steps 1 to 3, and the whole process is either repeated or a new course of action is suggested to the patient based on the data collected.
- To ensure complete treatment, the patient should be made to visit the hospital in correct intervals. No matter how well the model is trained, it certainly has its limitations and a physical doctor is essential in all situations. Planning and scheduling these visits based on patient health can ease the hospital's patient traffic. This involves proper staff and patient scheduling so that all patient demands are met in a timely fashion. This also involves analysing patient's data and based on the analysis, suggesting a particular day for hospital visit with a particular hospital staff. This will minimise the patient pooling in ER and will help the staff serve patients that actually require the care emergently.