

The Night in the ICU

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Night Service in the Intensive Care Unit of a University Hospital

This article draws attention to the extensive range of tasks and the stresses and strains during night duty in intensive care units. To this end, the range of activities of night duty nursing staff is presented using the example of the Hannover Medical School.

Night Service - An Important Service in the Multiple-Shift System

In order to ensure continuous patient care over 24 hours, work in the hospital area in a multiple-shift system is essential. In addition to early and late shift work, as well as other intermediate services during the day, night shift work is an integral part of the nursing staff's roster. In intensive care units (ICU) in particular, nursing staff perform a number of night shifts, since, in contrast to normal wards, a comparable personnel key must also be available there at night.

At present, the nursing staff lower limits regulation (PpUGV) regulates the care relationship between nursing staff and patients in Germany. According to this ordinance, nursing-sensitive hospital areas are considered separately, as there are correlations between the numbers of nursing staff and the occurrence of adverse events with regard to patient protection and the quality of care. In addition to the hospital areas of geriatrics, cardiology, neurology, trauma surgery and cardiac surgery, special regulations also apply to intensive care medicine. During the day,

a maximum of 2.5 patients may be cared for by one nurse in the ICU, while at night a maximum of 3.5 patients may be cared for by one nurse.

Those not involved are often unaware of the nursing activities that take place at night in ICU. The following text gives an overview by presenting the spectrum of activities in night service at the Hannover Medical School (MHH) as an example.

Areas of Responsibility in Night Service

In the ICU of the MHH, night duty usually begins at 7:45 pm. In addition to the ten-hour shift, employees are required to take a 45-minute break, so that the shift ends at 6:30 am.

At the beginning of each shift, the patients are first divided up in a short handover before a detailed handover at the patient's bed takes place. The nursing staffs then carry out a bed location check, during which the extensive technical equipment is checked and a patient inspection takes place. Among other things, monitoring the alarms on the monitors and checking

the infusion pumps and the ventilator, as they are having outgoing drains and secretion suction.

The complexity of the treatment cases at the MHH University Hospital differs significantly from that in hospitals providing standard care, and there is a broader range of treatment options. For this reason, intensive care nurses often care for multimorbid patients who are receiving dialysis therapy, are dependent on a heart-lung machine or need additional heart-supporting machines.

As the shift progresses, continuous monitoring of several patients simultaneously takes place. Despite a direct assignment of patients to each nurse, attention must of course also be paid to all other patients in the ICU. The trained specialist personnel continuously check the vital parameters and urine excretion as well as other disease-specific parameters of the patients and react to the alarms of the monitoring units. Any change in the general condition must be detected as soon as possible and requires immediate intervention.

Further tasks include the administration of medication as prescribed by a

doctor. Many drug therapies must also be administered continuously by infusion during the night. In the inter-professional patient data management system (PDMS), the responsible nursing staff has access to the treatment plan of each patient within the ICU. In addition to the data transfer from the medical devices, the laboratory values are transferred in this program and medical orders are immediately visible to the care team. In an hourly overview all arrangements are displayed. For example, medication orders, blood samples as well as microbiological examinations and other instructions for implementation appear there. In addition to the support provided by the documentation program, there is a continuous inter-professional personal exchange between the various experts.

By now, many other activities have been shifted to night duty. As a rule, there are fewer interruptions during the night due to planned examinations and visits by relatives. Therefore, at the beginning of the night shift, the nursing professionals provide basic and treatment care for sedated patients. In addition to personal hygiene, this includes responsible tasks such as changing dressings and repositioning the breathing tube.

At the MHH, a routine blood collection is carried out in the early morning hours in the ICU, for which the nursing staff prepares the required tubes and carries out the collection independently. In addition, a blood gas analysis is carried out at intervals of six hours, and more frequently if necessary. The nursing staffs are significantly involved in the evaluation of the results and immediately inform a responsible medical colleague in case of changes and critical results. During the night, as during the day, a permanent evaluation of the therapy takes place, so that the ventilation parameters, the drug therapy and the running rates of the perfusers are continuously adjusted.

At the MHH, the disposable material is also changed at night, which has a limited period of use due to hygiene

regulations. For example, the night shift changes the entire ventilation material, the suction system and the tube feeding system for enteral nutrition. In addition to these hygiene guidelines, work in the ICU is characterised by a high standard of hygiene. Patients are often treated with multi-resistant pathogens where special isolation measures are required.

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Emergencies can also occur during the night when a patient's health deteriorates acutely. Nurses must intervene quickly and act jointly with the medical profession. It is not uncommon for patients to be transferred from the normal wards or for emergencies to be admitted via the emergency department. In some cases, it is then necessary to transfer patients to the normal wards in the university hospital so that a patient with a critical state of health can be admitted.

Every action on the patient must be documented as in all shifts. The patient data management system described above is also used for this purpose.

The night shift ends for the nursing staff with a handover to the early shift.

Burdens for Nursing Staff and Patients

The description of the range of activities in the ICU of the MHH shows how demanding the work in night duty is. Nurses get into conflict with the biological rhythm of the body by working during the night.

When other people are usually asleep, the nursing staffs on night duty are awake. During the course of the day, carers have to sleep, while others go about their work and private lives. This altered rhythm can lead to fatigue and drowsiness (Ahasan et al. 2001). This increases the probability of mistakes at night. In one study it was shown that medication application errors and needle stick injuries occur more frequently during night work (Scott et al. 2006). Therefore it requires an enormous concentration of nursing staff, which is disturbed in particular by the high noise levels in ICU due to the technical equipment and the extended working hours of the night shift. In addition, the personnel key is lower during the night than during the day shift. As a result of the legal regulation already mentioned, nurses in ICU in Germany are generally responsible for 3.5 patients, although the condition of the patients does not change compared to the day. In one study it was shown that a low care key increases the risk of nursing staff suffering burnout (Aiken et al. 2002).

Working at night has other health effects for nurses and other professionals. Various research studies have shown that shift workers with working hours experience sleep problems during the night and that there is a correlation with the occurrence of diabetes mellitus type 2 (Pan et al. 2011). In addition, there is a dependency between night work and suffering from cardiovascular diseases and mental disorders such as depression (Moreno et al. 2019).

Another factor that can be caused by working at night is a reduction in the quality of life of those affected. The disturbed day-night rhythm can have an impact on interpersonal relationships, as the activities of daily life in our society are concentrated during the day. When friends and family members work regular hours, social interactions are more difficult (Ahasan et al. 2001). There are also barriers caused by the opening hours of government offices and service providers or the practice hours

of doctors, so that many nursing staffs are forced to shorten their sleep in order to be able to keep appointments. In addition to this aspect, carers are often restricted in their leisure activities by weekend services and working on holidays.

The night shift has an impact not only on the nursing staff but also on the patients. Patients' nocturnal rest is interrupted several times or in some cases permanently by sounds or light influences, which can have long-term consequences on the state of health and, for example, promote the occurrence of delirium. In particular, patients are disturbed by interventions on themselves or on their fellow patients (Bihari et al. 2012). Often diagnostic measures such as computer tomography, ultrasound examinations as well as catheter changes and operations have to be carried out at night because there was no capacity available during the day. These measures not only disturb the patients' night rest, but also mean a high workload for the nursing staff.

Although patient disorders can be reduced by consideration of the nursing staff, nightly nursing interventions cannot be avoided by necessary arrangements. Even disruptions caused by emergencies can only be eliminated by structural changes. When admitting patients at night, a night rest of the fellow patients in a multi-bedded room is not guaranteed.

However, in addition to the negative

aspects listed, there are also advantages from working at night. Many nursing staff appreciate the undisturbed work during the night shift, as there are usually fewer interruptions to work processes due to examinations and telephone calls. In addition, visiting hours for relatives in ICU of the MHH usually end at 7:30 pm before the late shift is handed over to the night shift. The increased numbers of hours worked results in several days off in a row for the nursing staff, which are also allocated during the week (Ahasan et al. 2001).

Conclusion

During the night, many activities are carried out in the ICU of the MHH that go far beyond monitoring patients. On the basis of the description of the range of tasks, an overview of the activities in night service was given. It illustrates that night work is very stressful for both nursing staff and patients so it requires special consideration from many sides. On the one hand, the planning of night services should take into account the individual wishes of carers, so that they can combine their profession and their social activities. Nursing staff themselves must also take the effects on their own bodies seriously, so that working at night does not put a strain on their health. On the other hand, the care professionals must pay particular attention to the patients' night's rest, so that planned interventions on the patient

are carried out in the early evening hours if possible.

Despite the aforementioned burdens of night duty, work in a multiple shift system is absolutely essential in everyday hospital life. In order to recognise the work of carers, it is advantageous to provide more information about their activities and to professionalise the profession. In Germany, it is extremely important that the nursing profession is more appreciated and recognised by society. In addition, the financial allowances for night work are also too low. ■

Key Points

- Night shift work is an integral part of the nursing staff's roster.
- Intensive care nurses often care for multimorbid patients who are receiving dialysis therapy, are dependent on a heart-lung machine or need additional heart-supporting machines.
- Continuous monitoring of several patients simultaneously takes place.
- Night work in the ICU requires an enormous concentration of nursing staff, which is disturbed by the high noise levels in ICU due to the technical equipment and the extended working hours of the night shift.
- The disturbed day-night rhythm can have an impact on interpersonal relationships, as the activities of daily life in our society are concentrated during the day.
- Night service also affects the health of the nursing staff. Diseases such as insomnia, diabetes mellitus type 2, cardiovascular diseases and mental illness are related to night duty.

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