The Early Warning Scoring System (EWS) was developed by Morgan et al in 1997 with the aim of providing a simple scoring system which could be readily applied by nurses and doctors to help identify patients developing critical illness. ‘Early warning scores have been developed to facilitate early detection of deterioration by categorising the patient’s severity of illness and prompting nursing staff to request a medical review at specific trigger points utilising structured communication tools whilst following a definitive escalation plan’. (Mitchell IA, McKay H, Van Leuvan C, et al. 2010). The observations in this scoring system should include six simple physiological factors; heart rate, respiratory rate, temperature, systolic blood pressure, oxygen saturations, level of consciousness. The use of early warning tools has been recommended by the Critical Care Outreach report published in 2003 and later advocated in the National Institute in Clinical
Excellence (NICE) Clinical guidance 50 ‘Acutely ill hospital patient’ suggesting these tools enhance equity in care by ensuring timely recognition of all patients with potential or established critical illness and their treatment by individuals with appropriate skills, knowledge and experience to treat the patient effectively. The purposes of the EWS are to ensure to assess the patients accurately with the clinical parameters which should be followed by calculating accurately and documenting the changes of EWS on the observation chart. Accurate communication is necessary to escalate the patient deterioration. Timely and appropriate intervention should be carried out following protocol will minimise the risk, improve patient safety and experience, it also important to record the response to the changes of EWS in patient documents.

Aim and Importance of monitoring Early Warning Score

The Department of Health (DH) has recommended the use of early warning systems as best practice for clinical observations since the publication of Comprehensive Critical Care (DH 2000). National Confidential Enquiry into Patient Outcome and Death (NCEPOD 2005) further approved this recommendation to emphasise that every inpatient should have an early warning score recorded. NICE (2007) stated: ‘Staff caring for patients in acute hospital settings should have competencies in monitoring, measurement, interpretation and prompt response to the acutely ill patient and they should be assessed to ensure that they can demonstrate them.’ The EWS should be calculated as part of initial and ongoing vital signs assessment and to be connected with appropriate communication between medical, nursing and other health professional staff. The main aim of EWS is to achieve appropriate and adequate medical review. ‘A consensus on acceptable physiological parameters for an individual patient and provide a monitoring plan that will prompt medical review where required’ (NICE 2007).’ Early Warning Scores are the signal for acute deterioration in clinical condition (Gao 2007). The policy and guidelines are modified to create a standardized approach to the assessment and recording of vital signs to assure timely and prompt intervention when patients require medical intervention. Early recognition of critically ill patients can improve patient safety and may even lower hospital mortality (Godhill 1999). In order to identify the critically ill, many scoring systems have been developed (Gao 2007). These scores use periodic observation of physical signs, including vital signs, carried out by nursing staff. These parameters are used to calculate score, and a response is required if the predefined threshold is exceeded. Catastrophic deterioration of patients is frequently preceded by documented deterioration of physiological parameters (Sax 1987). Failure of clinical staff to respond to deterioration of physiological function and to increase levels of medical intervention will put patients at risk of cardio-respiratory arrest. The physiological variables which can be assisted clinically remain the fast and the simplest way for patient evaluation. ‘The modified early warning Score (MEWS) is a physiological scoring system that can be used as a useful screening tool to predict the high risk patients who have high probability to develop cardio respiratory arrest among the critically ill patients’ (Carberry 2002). ‘The National early warning score (NEWS) provides the basis for a unified and systematic approach to first assessment of acutely ill patients and a simple track and trigger system for monitoring clinical progress for all patients in hospitals’ (RCP 2012). Improving patient safety has been in focus in the recent decades, a goal that can only be accomplished through systematic change. One organized approach is the Rapid Response System (RRS), an effort to bring intensive care knowledge outside the walls of the unit. It bridges across specialties and hierarchies and aims to centre care on the deteriorating patient before irreversible harm occurs. The implementation of an RRS is an evolution that reinforces the importance of paying attention to basic vital signs, a system that empowers the staff with direct access to critical care expertise and reduces the cardiac arrest and hospital mortality. Severe sepsis was the condition more identified by this system It may sound simple but is in fact a complex intervention, acting on many levels in the hospital structure. Normal vital signs change with age, sex, weight, exercise tolerance, and overall health. Hospital structures need to be developed to provide systematic approaches to find and treat deteriorating ward patients before their condition becomes irreversible. ‘A standardised early warning scoring system (SEWS) improved the documentation of a range of physiological parameters’ (RCP 2012).

Failure to rescue

‘Failure to rescue’ is the inadequate or delayed response to clinical deterioration in hospitalized patients. Rapid response systems are a set of hospital-wide interventions that attempt to reduce failure to rescue by improving patient monitoring on general wards and the reliability of the response to deterioration by a dedicated Critical Care Outreach Team, Rapid Response Team or Medical Emergency Team. The reliability of
such systems depends on the faultless functioning of a ‘chain of survival’ (Smith 2010) consisting of high-quality recording of vital signs, the education and mind-set of staff at the bedside to recognize pathological patterns, the reporting of abnormality to the efferent team, a timely and appropriate response by the latter. Repeated feedback loops are crucial for an effective functioning of the chain (Subbe and Welch 2013). Repeating effective feedback loops can avoid ‘Failure to rescue’. Standardisation is the friend of patient safety. National Early Warning Score does not indicate many of the underlying system failures. It is clearly documented that the inaccurate assignation of individual vital sign parameters to the correct EWS weighing group and the calculation of the total EWS is prone to significant error. Some of the Class room studies showed that EWS models based on five physiological parameters, around 40% of scores were inaccurately calculated which was most commonly underestimating the patient’s risk level. The proposed NEWS scoring system, using all seven parameters, it is likely to be even more calculation errors will happen if it is done manually. Accidents and errors happen in all areas of life. Ann McGinley states that introducing a NEWS system will lead to an increased workload on critical care outreach teams as they one of the chain of survivors. However, using effective early warning systems will help to avoid ‘failure to rescue’ scenarios and also reduce the need for escalation of care into critical care areas. These early interventions have the capability to reduce hospital stay of the patient, reduce morbidity, increase patient survival. The NEWS is based on the VitalPAC Early Warning Score (ViEWS), which is already started using in the UK. The RCP Working Group did not consider the handheld devices such as iPad touches, which may improve the management of this vulnerable group of patients. These devices can schedule, capture, alert and accurately calculate Early Warning Scores. They can convey the automated messages to senior colleagues and allow to follow the hospital protocols to the needs of individual patients and specialties. They will also improve productivity of all clinicians and provide fully auditable saved data. These are the factors where the paper-based systems fail. The RCP is promoting an approach in which patients will continue to suffer the harm which are avoidable. There are some recommendations to adopt a redesigned paper observation chart which represents a missed opportunity to promote a truly innovative and standardised approach to provide high quality care. Technological development progresses, we have sophisticated apparatus to use and diagnostic tools to guide us. At the same time, something is lost on the way as principles of measuring and even more importantly, understanding basic vital signs are neglected. Complex patients in general wards stand at risk of unrecognized deterioration which can lead to fatal consequences, something that holds little acceptance with today’s enlightened patient population. There is plenty of evidence that serious adverse events occur to hospital patients and that the majority may be preventable. There are variety of tools have been created and implemented in the UK in response to national recommendations in urge of using early warning score systems (NICE 2007). There are no evidences to support the use of any of these tools (Subbe et al 2007). However, there are many areas experiencing difficulty in using such tools and has reported poor compliance (Oakley and Slade 2006). Problems in using different tools and their reliability and accuracy have also been reported (Subbe et al 2007). There is evidence that acute illness is exacerbated by ‘failure to act’ on recognised changes (Hillman et al, 2001). ‘Analysis of serious patient safety incidents revealed that 11% of deaths were related to ‘deterioration not recognised or not acted upon’ (NPSA, 2007). The factors which can fail the process are not monitoring routine observations, not recognising early signs of deterioration, not escalating observations causing concern and not responding to concerns appropriately (NPSA, 2007). The monitoring of urine output is very important in many clinical areas. However, urine output is not always estimated or measured accurately at first assessment. The symptom of pain must be recorded and responded. Pain and its cause usually disturb physiological factors. These disturbances should be triggered in the scoring system. Especially post operative patients show symptom of pain and they are prone to deteriorate. It may not always generate the physiological disturbances. Including measurement of urine output and pain score also will help to recognise patient deterioration. The majority of patients an adverse clinical event is preceded by early clinical warning signs. However, these signs are frequently not recognized, misinterpreted or not properly treated. In acute hospital settings all clinical staff should have competencies in monitoring, measurement, interpretation and prompt response to the acutely ill patients. It should be appropriate to the level of care they provide. In house education and training should be provided to all clinical staff to ensure that staff have these competencies. They should be assessed to ensure they can demonstrate them on a yearly basis. Other drawbacks of this system is when there are clear escalation
instructions for calling a RRT exist, and the patients meet the criteria, staff do not always make the call. The reasons for failing to follow the protocol are poor communication and prioritisation by the medical team involved, and failure to repeat abnormal observations. Staffing levels and monitoring equipment availability are the other important factors of timely monitoring observations (Shearer et al 2012). Staffing level is the main issue found on most of the clinical settings. Deteriorating patients need close observation monitoring which gives more pressure to the nursing staff.

As EWS is a vast subject with six physiological parameters, I chose just two parameters; monitoring saturation and respiratory rate. Incorporation of oxygen saturation improves the power of early warning scoring systems. The NEWS Development and Implementation Group (NEWSDIG) recommend that oxygen saturation should be routinely monitored as part of NEWS as oxygen saturations are powerful tool for assessing cardiac and pulmonary function. When supplemental oxygen is required to maintain target oxygen saturations defined for each individual inpatient, it should be formally prescribed (British Thoracic society) but during emergency situation this happens rarely. The introduction of pulse oximetry was a major advance in bedside monitoring, it still has a number of practical drawbacks. They are poor understanding of the purpose and correct use of pulse oximetry among nurses and junior doctors (Attin et al 2002). The reasons for inaccuracy of pulse oximetry are reduced perfusion at the site of measurement, during hypothermia or in shock. ‘Respiratory rate is emphasised and should be recorded graphically unless its position on the chart might conflict with the recording of another parameter where recording actual numbers might make it clearer (Hogan 2006).’ Many clinicians under estimate the importance of respiratory rate though it is an early indicator of disease. Some hospitals report a poor level of respiratory rate recording. Accurate monitoring of respiratory rate will have an impact on the nature and timeliness response to critically ill patients. Abnormalities of respiratory rate are early markers of disease. This may have an impact on the future incidence of potentially avoidable unanticipated intensive care unit admission, cardiac arrest, and deaths. A qualitative study of Hogan(2006) found that the respiratory rate was the one parameter that was recorded less than 50% of the time. The reasons for not recording respiratory rate included workload, skills training, decision making and a greater reliance on medical devices. ‘Goldhill and colleagues reported that 21% of ward patients with a respiratory rate of 25’29 breaths/minute evaluated by a critical care outreach service died in hospital’. Patients with a higher respiratory rate have an even higher mortality rate. Some recent evidence suggests that an adult patient with a respiratory rate of beyond 20 breaths/minute is probably unwell. An adult with a respiratory rate of beyond 24 breaths/minute is likely to be critically ill. It is very important to note that not all causes of hypoxia and hypercarbia result in an increase in tidal volume and respiratory rate. Opiates which are commonly used in hospitals, can depress the respiratory system and the respiratory system which response to hypoxia and hypercarbia. In all circumstances the respiratory rate is a useful tool to monitor for an adverse event. There can be alteration in level of consciousness as the respiratory rate may be lowered.(West 1990).

Conclusion

The Royal College of Physicians (RCP) should be complimented for introducing NEWS which helped to draw national attention to that the thousands of avoidable deaths in English hospitals each year due to the failure to recognise and respond appropriately to signs of deterioration. Some studies say that the current system is unsafe and expensive. So the NEWSDIG decided to work with the Clinical Effectiveness and Evaluation unit at the RCP, which will help to investigate the options for ongoing monitoring and evaluation of NEWS and a formal assessment of its effectiveness. The implementation of validated scoring systems aimed at the recognition of higher risk patients at point of entry to care may resolve some of the issues raised in the NCEPOD report. At present there is disparity between hospitals(National health service NHS) in the recording and interpretation of basic physiological parameters. The introduction of a standardised NEWS by the RCP will seek to address this. MEWS have been found to be very effective in predicting hospitalisation and in-hospital mortality of medical and surgical patients presenting to the emergency department. Easily recordable physiological abnormalities and mortality are associated, If we allow interventions to take place appropriately can reduce hospital mortality. Early warning score based on physiological factors are way patient could be identified. Evidence suggests that many patients are in hospital for days before they admit into critical area. NEWS is an opportunity to improve consistent practice in the NHS and it appears similar to ABCDE approach for resuscitation that has been approved by healthcare providers globally.
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