Abstract: A surgical assessment unit (SAU) was established in October 2009 at the Mid-Western Regional Hospital. We assessed this service in its initial year and compared it to Emergency Department (ED) services. We audited SAU and ED databases and theatre logbooks from November 2009 to October 2010. 1949 patients were referred to the SAU and 857 patients were admitted (44%). Only 44 SAU patients (6%) waited more than 8 hours for a bed compared to 828 patients (68%) admitted through the ED. SAU patients who required emergency surgery had a shorter waiting time before theatre (37(16.6%) vs 9(6%) waited less than 6 hours, p<0.05). To summarise, we found that almost 2,000 patients who would otherwise have presented to the ED were referred to the SAU. Waiting times for admission and theatre were significantly shorter. Further resource allocation could expand the service and improve it further, by diverting more patients from the ED.

Introduction
The surgical services in the Mid West region have been reconfigured since 2009. Now, all acute surgical patients in three peripheral hospitals - over 2,800 admissions per annum - are referred to one centre (Mid-Western Regional Hospital Limerick, MWRHL), for assessment and/or admission. It was known that this could potentially increase the numbers of referred surgical patients passing through ED to an unmanageable level overwhelming an already highly pressurised service. One of the initiatives taken as part of reconfiguration to offset this increased workload was the establishment of a Surgical Assessment Unit (SAU). Medical assessment units are already established in several centres in Ireland, the UK and other countries, with evidence showing that they can increase efficiency by decreasing delays in admission and reducing length of stay. There is limited information regarding SAUs. A SAU was established in our hospital in 2009 and the aim of this study was to audit our initial experience over its first year of operation and compare it to similar ED services over the same time period.

Methods
The SAU was opened in October 2009. It is a dedicated area on a surgical ward with four trolleys and operates from 8am to 8pm on weekdays. The unit is run by dedicated nursing staff with clerical/administrative support during the day. Telephone referrals are accepted from GPs, other hospitals, and other teams within the hospital. Referrals are taken by the senior nurse in the SAU and can be discussed if necessary with the surgical registrar on call. There are a number of categories of patients who are not eligible for assessment in the SAU (Figure 1). The surgical team who are oncall for a particular week cover the SAU and elective commitments are curtailed in advance to facilitate this. The intern performs the initial assessment/clerking of the patient and then the registrar reviews each patient and decides on the management plan which may involve admission for further investigation/treatment, discharge with appropriate follow-up, or acute management in the SAU.

This was a retrospective review. All SAU and ED admission data is prospectively entered into computer databases. We audited these databases and theatre logbooks to examine referral and admission patterns over a 12-month period from November 2009 to October 2010. The SAU and ED figures were compared to the ED figures for comparable days and time periods i.e. 8am to 8pm, Monday to Friday. The data gathered included numbers of referrals and admissions, time waiting to be admitted, numbers of patients undergoing emergency surgical procedures and time from admission to theatre. Categorical variables were compared with Fischers exact tests.

Results
In total, 1949 patients were referred to the SAU over the 12-month period, 1586 patients were seen in the SAU and 862 were admitted (54%). In the same time period 1228 patients were admitted surgically through the ED. Referral sources were similar in both groups, the majority being GP referrals (Figure 2). The main reason for the majority of the 370 referred patients (19%) not being seen in the SAU was because of a lack of capacity. This can happen when patients are referred outside the opening hours or when there is no space in the SAU. Other reasons are presented in Figure 3. Inappropriate referrals (33%) included head injuries, unstable patients and those whose presenting complaint was referred to a surgical subspecialty, the commonest subspecialty referral was urology.

Figure 1 - Eligibility of patients for the SAU

Figure 2 - Referral source of patients referred to acute surgical services in our region

Figure 3 - Reasons why patients were referred to the SAU, but not seen (n=370)
Waiting times for a bed on a ward were shorter for SAU patients compared to patients admitted through the ED. The mean time from call to theatre was 1 hour 59 minutes (range 0-21 hours); 260 patients (7.6%) were admitted within 1 hour. Only 6% of patients admitted through the SAU waited more than 6 hours for a bed compared to 68% of those admitted through ED (p < 0.0001, Fischers exact test) (Figure 4). Of the patients admitted through the SAU, 156 (19.4%) required emergency surgery (surgery within the first 7 days of admission). This was similar to the ED figure of 18.3%. Of those patients who had surgery within 24 hours of admission, the median time between admission and surgery was 8 hours in the SAU patients compared to 12 hours for ED patients. In total 18.6% of SAU patients arrived in theatre within 6 hours of admission compared to 6% of A&E patients (p < 0.05). There was a similar profile of emergency procedures across the two groups. Laparoscopy/appendicectomy and abscess drainage accounted for 66.7% of SAU and 73.9% of ED activity.

Discussion

In our centre, emergency services are nearing crisis point. The initial assessment of acute patients takes place in the Emergency Department (ED) and the number of patients who present annually to the ED has been increasing for some time. In 2009 for example, 46% of patients were waiting 12 hours or more between registration in ED and either admission or discharge. In the UK, there is a nationally-enforced 4-hour limit on ED waiting times.

The establishment of acute medical admission units dates back to 2005 to accommodate the large number of medical patients attending the ED, who require urgent medical admission, but not the services of an emergency department. A similar service is now clearly necessary for surgical patients. In the first year of the reconfiguration of surgical services in the mid west area, there were 2,700 additional acute surgical admissions. There was clearly insufficient capacity to accommodate these acute patients in the existing ED. In its first year, 600 patients who would otherwise have to attend the ED were seen in the SAU as a result of a phone call from their GP. They then had direct access to specialised surgical care more quickly than if they had attended the ED.

Probably the most striking difference in the patient journey of the two comparable groups was the shorter waiting times for admission of those presenting at the SAU. This has also been the case in SAUs established in other hospitals, did not formally compare time to be assessed by a doctor or time for a clinical decision as it was clear that these data are not reliably documented and would be very difficult to obtain. Time from registration to discharge or admission was more robust and possibly more relevant. Patients who were seen in the SAU and required emergency surgery had a shorter time to wait before their procedure. We realise that many factors impact on the time delay to theatre but one important factor is bed availability, placing patients seen in the SAU at an advantage. As well as minimising patient discomfort, fasting time and chance for their condition to deteriorate, a shorter waiting time from admission to theatre also helps to reduce overall length of stay.

There are several reasons why SAU patients are assessed more quickly. They are not seen initially by the ED physician as the triage system is stricter and patients are only accepted if they are considered to have a stable surgical condition. Secondly, SAU patients are only seen on a referral basis which involves giving each patient an appointment time during the day. This matches patient numbers to department capacity and minimises the waiting-room delay for the patient. Diagnostic delays do exist in the SAU, but certain imaging requests are prioritised over similar requests from the A&E department on the basis of an arrangement between the radiology department and the surgical department, possibly because they are coming directly from the surgical team who will be making a more specific treatment decision based on the findings. This facilitates earlier diagnosis and management leading to shorter length of stay.

The unit is small and self-contained with dedicated nursing staff. All trolleys are in one room facilitating quick and efficient reviews. This is in contrast to the situation in the ED where due to the large volume of patients who are non-surgical, reviewing a patient may involve locating the patient, their medical notes, their nurse, and finding a free cubicle to examine them, all of which may be problematic. The SAU is located closer to theatre making it easier to review patients between cases which facilitates faster review by a senior clinical decision maker. This avoids the situation where patients are admitted by the surgical SHO and are moved to a ward bed before they are reviewed by the surgical registrar. If the registrar decides to discharge the patient, a ward bed has been occupied unnecessarily, and if they are not reviewed until late at night, patients frequently do not leave the hospital until the following morning. Therefore the SAU may reduce unnecessary bed usage.

There are other advantages associated with the SAU. One team covers the unit for a week so patients who do not need to be admitted acutely but may require re-assessment can be given an appointment to be reviewed again after a few days. This may also reduce unnecessary admissions. The SAU is also an excellent teaching environment for medical students and interns. The main limitations of the SAU are related to its capacity. The limited clinical space and opening hours means that the SAU frequently had to turn away patients and this was the commonest reason that patients referred there could not be seen.

Access to the SAU is affected by the bed shortages that are well documented in all the large regional hospitals throughout Ireland. Consequently, just as occurs in the ED, when there are no beds in the hospital, the patients who require admission are kept in the SAU, in effect blocking these trolleys and preventing the SAU from accepting any more referrals. We believe that the SAU should have extended opening hours during the day and be available at weekends as is the case with many established SAUs in other centres. If the capacity of the SAU could be increased it could accommodate a greater number of patients as has been found in other units16 and potentially, divert other GP referrals away from the ED as well as accepting other sub-specialities such as orthopedics which currently wait longer than the scope of the SAU even further, and potentially facilitate more efficient processing of acute surgical patients. In an era of global shortages and financial constraints, superior-performing units should be optimised. We believe that as an integral and valuable part of the reconfiguration process the SAU should be expanded to accommodate greater numbers of patients.

To summarise, almost 1600 patients who would otherwise have presented to the ED were seen in the SAU in its first year. Only the same opening hours and patient categories, the SAU admitted 41.2% of patients compared to a much smaller capacity of patients through the ED. This is despite the much smaller capacity of the SAU. Admission waiting times and time to theatre were significantly shorter in the SAU, due to the more direct access to the surgical team on call. This improves patient care and relieves pressure on already scarce ED resources. We feel the SAU can be improved further if additional resources can be allocated and that it is a valuable and essential part of the surgical care pathway.

Figure 4 – Waiting times for admission in the ED vs SAU

Discussion

In our centre, emergency services are nearing crisis point. The initial assessment of acute patients takes place in the ED and the number of patients who present annually to the ED has been increasing for some time. A frequent issue is overcrowding in ED. In the UK, there is a nationally-enforced 4-hour limit on ED waiting times.

The establishment of acute medical admission units dates back to 2005 to accommodate the large number of medical patients attending the ED, who require urgent medical admission, but not the services of an emergency department. A similar service is now clearly necessary for surgical patients. In the first year of the reconfiguration of surgical services in the mid west area, there were 2,700 additional acute surgical admissions. There was clearly insufficient capacity to accommodate these acute patients in the existing ED. In its first year, 600 patients who would otherwise have to attend the ED were seen in the SAU as a result of a phone call from their GP. They then had direct access to specialised surgical care more quickly than if they had attended the ED.

Probably the most striking difference in the patient journey of the two comparable groups was the shorter waiting times for admission of those presenting at the SAU. This has also been the case in SAUs established in other hospitals, did not formally compare time to be assessed by a doctor or time for a clinical decision as it was clear that these data are not reliably documented and would be very difficult to obtain. Time from registration to discharge or admission was more robust and possibly more relevant. Patients who were seen in the SAU and required emergency surgery had a shorter time to wait before their procedure. We realise that many factors impact on the time delay to theatre but one important factor is bed availability, placing patients seen in the SAU at an advantage. As well as minimising patient discomfort, fasting time and chance for their condition to deteriorate, a shorter waiting time from admission to theatre also helps to reduce overall length of stay.

There are several reasons why SAU patients are assessed more quickly. They are not seen initially by the ED physician as the triage system is stricter and patients are only accepted if they are considered to have a stable surgical condition. Secondly, SAU patients are only seen on a referral basis which involves giving each patient an appointment time during the day. This matches patient numbers to department capacity and minimises the waiting-room delay for the patient. Diagnostic delays do exist in the SAU, but certain imaging requests are prioritised over similar requests from the A&E department on the basis of an arrangement between the radiology department and the surgical department, possibly because they are coming directly from the surgical team who will be making a more specific treatment decision based on the findings. This facilitates earlier diagnosis and management leading to shorter length of stay.

The unit is small and self-contained with dedicated nursing staff. All trolleys are in one room facilitating quick and efficient reviews. This is in contrast to the situation in the ED where due to the large volume of patients who are non-surgical, reviewing a patient may involve locating the patient, their medical notes, their nurse, and finding a free cubicle to examine them, all of which may be problematic. The SAU is located closer to theatre making it easier to review patients between cases which facilitates faster review by a senior clinical decision maker. This avoids the situation where patients are admitted by the surgical SHO and are moved to a ward bed before they are reviewed by the surgical registrar. If the registrar decides to discharge the patient, a ward bed has been occupied unnecessarily, and if they are not reviewed until late at night, patients frequently do not leave the hospital until the following morning. Therefore the SAU may reduce unnecessary bed usage.

There are other advantages associated with the SAU. One team covers the unit for a week so patients who do not need to be admitted acutely but may require re-assessment can be given an appointment to be reviewed again after a few days. This may also reduce unnecessary admissions. The SAU is also an excellent teaching environment for medical students and interns. The main limitations of the SAU are related to its capacity. The limited clinical space and opening hours means that the SAU frequently had to turn away patients and this was the commonest reason that patients referred there could not be seen.

Access to the SAU is affected by the bed shortages that are well documented in all the large regional hospitals throughout Ireland. Consequently, just as occurs in the ED, when there are no beds in the hospital, the patients who require admission are kept in the SAU, in effect blocking these trolleys and preventing the SAU from accepting any more referrals. We believe that the SAU should have extended opening hours during the day and be available at weekends as is the case with many established SAUs in other centres. If the capacity of the SAU could be increased it could accommodate a greater number of patients as has been found in other units16 and potentially, divert other GP referrals away from the ED as well as accepting other sub-specialities such as orthopedics which currently wait longer than the scope of the SAU even further, and potentially facilitate more efficient processing of acute surgical patients. In an era of global shortages and financial constraints, superior-performing units should be optimised. We believe that as an integral and valuable part of the reconfiguration process the SAU should be expanded to accommodate greater numbers of patients.

To summarise, almost 1600 patients who would otherwise have presented to the ED were seen in the SAU in its first year. Only the same opening hours and patient categories, the SAU admitted 41.2% of patients compared to a much smaller capacity of patients through the ED. This is despite the much smaller capacity of the SAU. Admission waiting times and time to theatre were significantly shorter in the SAU, due to the more direct access to the surgical team on call. This improves patient care and relieves pressure on already scarce ED resources. We feel the SAU can be improved further if additional resources can be allocated and that it is a valuable and essential part of the surgical care pathway.
Correspondence: P Burke
Department of Vascular Surgery, Mid-Western Regional Hospital, Dooradoyle, Limerick
Email: paul.burke1@hse.ie

References