Observation Units in the Emergency Department

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The following review is the summary of “the American College of Emergency Physicians State of the Art: Observation Units in the Emergency Department Policy Resource and Education Paper”

Background

Ramathibodi hospital emergency department (ED) are facing with the problems of limited spaces for admission, mismatched resource utilization, and overcrowding at the emergency room. Many referral hospitals have used the emergency department observation units (EDOU) to address these problems. The concept of short staying in the hospital as an alternative way to admission has been described for over three decades. Knowledge in this field has increased in recent years, resulting in a better understanding of its roles and benefits.

Concepts, Principles, and Definitions

The average time of patient for ED staying is 5.5 hr while that of for an inpatient is 5 days. Studies have shown that there is specific group of patients that needs to stay in the hospital longer than that is in the ED but shorter than that is in the inpatient, averaging 6-24 hr. Short stay patients admitted to the EDOU, are seen by a senior doctor sooner, have fewer investigations, and have a shorter stay in hospital than similar patients admitted to the general wards. In addition, if this group of patients is admitted to the general ward, the length of stay (LOS) likely increases to more than 24 hr. Therefore, observation ward is more efficient than general ward at dealing with short stay patients.

The quality of EDOUs is the management of patients after their initial ED cares in order to determine the need for inpatient admission. Observation units named differently based on local preferences and specific type of patients. Examples are - ED Observation Unit, Clinical Decision Unit, Chest Pain Unit, Short Stay Unit, and Rapid Diagnosis
and Treatment Unit. It is important to distinguish “observation” patients from patients in the ED who already have a disposition but are waiting for an inpatient bed, transfer, discharge, or going to the OR. Some EDOUs allow these patients to use their beds as needed. However filling an EDOU with awaiting patients may result in ED patients that might have been observed and discharged being admitted – therefore, worsening a system problem rather than solving it.

**ED Observation Unit Management Issues**

The principles of managing an EDOU include; 1) Focused patient care goals, 2) Limited duration and intensity of services, 3) Appropriate hospital location, 4) Appropriate staffing, 5) Providing an ongoing care to an ED patients, 6) Intensive review, and 7) Economical service. Patients admitted to an EDOU should have a clear reason for observation. This allows for appropriate patient selection, protocol development, and predictable outcomes. Patients may be observed for further diagnostic testing, continued treatment of an acute condition, or management of psychosocial needs. Patients selected for treatment should have at least a 70% probability of discharge, have a relatively low severity of illness and require a level of service that is appropriate for the unit. Patients at risk of self-harm require a facility in which they can be monitored. If this is not possible in the EDOU, it may be safest to exclude them. Most studies of observation services have shown the LOS to be around 15 hr. Patients, who cannot be discharged by 18-24 hr, are unlikely to do so with additional time in the EDOU. EDOU patients are seen sooner by a doctor, have fewer investigations, and have a shorter stay in hospital than similar patients admitted to the general wards. Patients with chest pain, asthma, transient ischemic attack (TIA), syncope, and atrial fibrillation (AF) who are managed in an EDOU have shorter LOS, improved patient satisfaction, lower costs, and comparable or better clinical outcomes relative to similar patients admitted to an inpatient unit. It is best for the unit to be located near by the ED since remote settings can create problem with staffing, clinical re-evaluations, and transfer of care. As patients are not expected to spend more than 24 hr in an EDOU, the rooms usually do not have to meet the standards of an inpatient room.

The American College of Emergency Physician’s policy on EDOUs recommends that the EDOU have guidelines that describe medical and nursing leadership, general criteria for admission and discharge from the EDOU, a clear statement of which physician and nurse will be responsible for the patient throughout the day, how to document and transfer the patient, when a physician should be notified, maximum allowable LOS in the unit, means of addressing conflicts, and how utilization and quality will be monitored. Some units are protocol driven with guidelines for common specific conditions. Such protocol driven units encourage consistency between providers and facilitate efficient care.
Physician documentation in the EDOU begins with the initial evaluation and management in the ED. This includes initial decision-making, communications, and plans for care in the EDOU. The ED documentation should be present on the patients chart upon arrival to the EDOU for subsequent providers to review. EDOU orders are required and may be protocol driven for specific conditions. Progress notes are written as needed and a final discharge summary should be completed. The discharge summary include the patient’s clinical course in the EDOU, the final examination, final diagnosis, preparation of discharge or admission records, and instructions for continuing care.

The EDOU prevents inappropriate admissions or discharges. To ensure optimal performance, it is essential to monitor appropriate EDOU utilization and quality of care (Table 1). EDOUs have average LOS of 15 hr and discharge rates of 70 to 80%. Conditions exceeding these standards should be investigated.

Table 1. ED Observation Unit Monitors

<table>
<thead>
<tr>
<th>Utilization monitors</th>
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<tr>
<td>Key data elements – patient identifier, reason for observation, date/time elements (ED arrival, EDOU arrival, EDOU departure), disposition (admit/discharge)</td>
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<td>Utilization monitors – to be reviewed monthly and annually, for the unit as a whole and by specific condition:</td>
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<tr>
<td>• EDOU Census – for unit and by condition</td>
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<tr>
<td>• Length of stay - average and outliers (LOS &lt;6 hours, LOS &gt; 24 hours).</td>
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<tr>
<td>• Percent discharge</td>
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<tr>
<td>• Percent of ED census observed</td>
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<td>• Number of patients / EDOU bed / day.</td>
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<th>Quality monitors</th>
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<tr>
<td>• Return visits within 7 or 14 days</td>
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<tr>
<td>• Concerns and complaints</td>
</tr>
<tr>
<td>• Patient satisfaction surveys</td>
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<tr>
<td>• Unit and protocol compliance audits</td>
</tr>
<tr>
<td>• ICU admissions</td>
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<tr>
<td>• Seizure events, resuscitations, and deaths in the unit</td>
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Revisiting following an EDOU visit is another important measure of quality and resource utilization. ED observation unit recidivism rates do differ according to observation category, with painful conditions showing the highest recidivism rates. Studies found no difference in revisiting rate between EDOU versus inpatient setting among patients with chest pain, asthma, heart failure, and transient ischemic attack.

To be successful, an EDOU must be cost effective and equitable for the hospital, physician and those paying for health care services. Both emergency services and observation services are classified as an “outpatient” service. Hospital observation services require documentation of medical necessity and a physician order for the service to be provided. The majority of observation care should require less than 48 hr, and “usually less than 24 hr. For emergency physicians, observing the patient in the EDOU creates an added amount of work relative to simply admitting or discharging the patient from the ED. The team that staffs this unit should be paid accordingly. Other services associated with an observation visit may have separate additional payment codes, which are paid.

Opening an EDOU reduces the monthly hour of ambulance diversion and patients that leave the ED without being seen in half. This reduction is thought to be a direct result of decongesting the ED and opening inpatient beds through avoided admissions. The hospital beds which might have been occupied by observation patients can alternatively be
filled with higher acuity, more financially advantageous, hospital admissions. Furthermore, improved patient satisfaction might attract more patients to a hospital.

**Selected clinical conditions appropriate for observation**

**Pediatric EDOU patients**

Common pediatric EDOU conditions are listed in Table 2. The average LOS for pediatric patients varies from 5.5 to 20.4 hr. The LOS is lower in pediatric patients (11.2 hr) than adult non-geriatric (15.1 hr) or geriatric patients (15.4 hr). The rate of inpatient admission of pediatric EDOU patients ranges from 10.4% to 25%, depending on variables such as conditions managed, setting (academic vs. community hospital), and country. Physician satisfaction with a pediatric EDOU is high. A pediatric observation unit decreases the hospitalization rate, increases inpatient complexity, and lower costs.

<table>
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<tr>
<th>Rank</th>
<th>Pediatric EDOU common conditions</th>
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<tbody>
<tr>
<td>1</td>
<td>Asthma</td>
</tr>
<tr>
<td>2</td>
<td>Dehydration</td>
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<tr>
<td>3</td>
<td>Gastroenteritis</td>
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<tr>
<td>4</td>
<td>Pneumonia</td>
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<tr>
<td>5</td>
<td>Abdominal pain</td>
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<tr>
<td>6</td>
<td>Seizures</td>
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<tr>
<td>7</td>
<td>Fever</td>
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<td>8</td>
<td>Bronchiolitis</td>
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<tr>
<td>9</td>
<td>Croup</td>
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<tr>
<td>10</td>
<td>Poisonings</td>
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<td>11</td>
<td>Trauma</td>
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Asthma is the most common chronic disease of childhood. Observation therapy is medically and economically effective in this group of population. The EDOU discharge rate for pediatric asthma patients is 67% to 75% with a median LOS of 16.5 hr and an overall decrease in hospital admission rates from the ED. The mean costs for the hospitalized asthmatic patient was nearly three times that for the holding room patient. A study of pediatric croup patients found a significant reduction in hospitalization rates, LOS, and hospital charges. Children with dehydration from gastroenteritis have successful EDOU discharge rates following failed initial ED therapy. Low risk patients with hyperbilirubinemia can be managed successfully in the EDOU.

**Geriatric patients**

The discharge rates among the elderly ranges from 71% to 74%, which are slightly lower than younger patients. The odds of subsequent inpatient admission for the elderly were highest for back pain, urinary tract infection, and chest pain. EDOU LOS for elderly patients is 15.8 hr. The rates of related return visit within 30-days are similar between elderly and younger patients. There are unique benefits of shorter hospital stays in the elderly. The elderly admitted to the hospital have higher rates of adverse drug events, nosocomial infections, falls, use of restraints, pressure sores, delirium, and a decline in functional status. However, elderly EDOU patients are also likely to require more resources.
due to their greater health care needs. The EDOU is an ideal setting to involve geriatric and social services to help manage these patients.

**Specific conditions appropriate for observation**

**Chest Pain**

Chest pain is the most common condition managed in an EDOU. Studies have described improved outcomes with chest pain observation programs. Relative to inpatient admission, chest pain protocols at EDOU are associated with lower cost, shorter LOS, and improved resource utilization. EDOU significantly reduces the rate of missed MI, cost, and inpatient admission. ED chest pain patient satisfaction and quality of life are improved with care in an EDOU compared to inpatient care. The clinical outcomes are similar to patients managed in an inpatient.

**Asthma**

Patients with acute asthma attacks frequently present to ED for acute treatment. The observation unit interventions include bronchodilator treatments, serial examinations, peak flow testing, and hydration. This results in significant cost savings since 25% of patients that require care beyond ED treatment can be successfully treated in the EDOU and discharged. Studies show that 59% of EDOU asthmatics were discharged home compared with routine inpatient care where all were admitted. There were no differences during the follow-up period in terms of relapse rates or subsequent morbidities. However EDOU asthmatic patients have lower in their LOS, costs, and higher quality of life.

**Congestive Heart Failure**

Initial experience suggests that observation unit management of heart failure patients is safe and cost-effective. The EDOU treatment protocol for heart failure was associated with a 56% reduction in the 90-day heart failure ED revisit rate and a 64% reduction in the 90-day heart failure rehospitalization rate. Additionally, there was a trend toward a reduction in the 90-day mortality rate, from 4% to 1%. Successful discharge of patients from the EDOU depends on appropriate patient selection. The heart failure patients with a systolic blood pressure over 160 mm Hg on ED presentation and a normal initial cardiac Troponin I were significantly more likely to be discharged from the EDOU and not experience a 30-day adverse events (death, readmission, myocardial infarction, arrhythmias).

**Abdominal Pain**

Abdominal pain is the most common reason for ED visits in the United States. Acute appendicitis is the most common cause of an acute abdomen. The “active observation” of selected patient with acute abdominal pain improves
patient care and is necessary to the evaluation of abdominal pain. Patients may be admitted to the EDOU for serial exams and diagnostic tests, such as CBC or selective imaging. Short term observation of patients with suspected appendicitis is effective in determining the need for surgery. A prospective randomized trial showed that the use of CT in women of childbearing age who presented with right lower quadrant pain was not significantly different from clinical assessment by an experienced clinician in identifying patients who requires an appendectomy. Hence, active observation with or without CT scan remains an important strategy in the management of patients with suspected appendicitis. The EDOU also improves the management of other conditions such as ureteral colic, uncomplicated diverticulitis, and uncomplicated upper GI bleeding.

Syncope

A high risk for cardiac events patient with syncope deserves inpatient admission for work up of the underlying disease. However, 30% of syncope patients admitted by emergency physicians have a less than 2% estimated risk of serious outcomes. The syncope unit protocol includes serial vital signs and continuous cardiac monitoring for up to 6 hr. When clinically indicated, patients should receive an echocardiogram (for an abnormal ECG or cardiovascular exam) or a tilt-table test with electrophysiology consultation. At the time of dismissal from the ED, the presumptive cause of syncope was established for 67% of patients. The total hospital bed days were reduced by 54% and 2-year clinical outcomes, including all-cause mortality and recurrent syncope, were similar between EDOU and admitted inpatients.

Dehydration

Patients who present to the ED with dehydration require intravenous fluids therapy, anti-emetics, and reassessment. The diagnosis of dehydration was identified as the highest risk for early return visit to the ED and subsequent admission to the hospital on early return. Hence, these patients are ideal for further management in the EDOU after initial resuscitation in the ED. High risk patients, such as those with renal failure, CHF, liver failure and those with hemodynamic instability should be excluded from the EDOU.

Transient Ischemic Attack

Recommendations regarding the disposition of ED patients with TIA remain vague. Treatment of TIA patients in an EDOU has been suggested as an alternative. Compared with the inpatient group, patients in the accelerated diagnostic protocol group in EDOU have total LOS that are half as long, lower 90-day total direct costs, and comparable 90-day clinical outcomes. Accelerated diagnostic protocol patients are more likely to undergo carotid imaging and
echocardiography. Both groups had comparable rates of related return visits, subsequent strokes, and major clinical events. In the EDOU TIA protocol patients, the risk of stroke was 1.2% at 7 days and 2.4% at 90 days, which was lower than that rates estimated by patient ABCD scores.59

Atrial Fibrillation

AF patient with uncomplicated acute onset (<48 hr) may be eligible for treatment in an EDOU based on current American Heart Association practice guideline. This subgroup does not require routine anticoagulation or transesophageal echocardiograph before cardioversion.60 With this approach 82% of this subset may be discharged home in an average of 11.8 ±7.0 hr.13 AF accelerated treatment protocol reduces mean cost.61 The 8-hour EDOU protocol included an initial ECG, chest radiograph, and blood work. This was followed by pharmacologic heart rate control using a calcium channel blocker or a B-blocker. All patients received continuous cardiac monitoring and were reassessed after 6 hr. Those still in AF were sedated and received electrical cardioversion followed by observation for at least 2 more hr. Those in sinus rhythm after the 2-hour observation period were discharged home, with cardiology follow-up arranged within 3 days. Patients in the EDOU group had substantially shorter hospitalizations with a median LOS of 10.1 versus 25.2 hr and were 12% more likely to be discharged in sinus rhythm. There were no significant differences between the groups in terms of their frequency of recurrent AF, re-hospitalization, number of tests or procedures, or adverse events during their 6-month follow-up.13

Deep Vein Thrombosis

In DVT patient, prompt anticoagulation is necessary to halt progression of the thrombus and to prevent the development of symptomatic pulmonary embolism. Recommendations for treatment of DVT by ACP and ACCP state that outpatient treatment should be provided whenever possible.62 This approach is cost effective, reducing both healthcare costs and hospital LOS.63 Compared with inpatients, those treated for DVT at home have greater levels of physical activity and social functioning, and demonstrate a more rapid return to pre-morbid levels of activity.64 Coordination between outpatient laboratory testing during bridge therapy, pharmacy, patient education and home healthcare is complex and time consuming. As a result, it is often not feasible to effectively coordinate this therapy in the timeframe of an ED visit. For this reason, the EDOU is an ideal setting for initiation of this therapy.65 If patients develop bleeding or thromboembolic complications, these patients will be admitted. Otherwise, patients with confirmed uncomplicated DVTs should have low molecular weight heparin therapy initiated, receive patient education and training for self-injections, and arrangements for timely outpatient clinic evaluations including INR testing while heparin bridge therapy is being provided.66
Infections

Uncomplicated infectious diseases such as community-acquired pneumonia, pyelonephritis and cellulitis are common ED conditions.

**Pneumonia** - Recent community acquired pneumonia (CAP) guidelines by ACEP note that observation in the EDOU is an alternative option for patients with low risk CAP.\(^6^7\) Decision rules such as PORT scores, PSI, and CURB-65 are designed to predict the risk of death. However, patients with a low score may have other issues, such as mild hypoxia or vomiting, that would prevent immediate discharge. This group of patients are ideal for the observation unit. The outcomes of a Hong Kong based CAP outpatient program that used the EDOU showed 83\% of CAP patients treated were discharged with no return visits, while 12.5\% required hospital admission within 30 days.\(^6^8\) Factors associated with the need for subsequent re-hospitalization included TB, malignancy, persistent fever, IVDA, alcoholism, and co-morbidities such as rheumatoid arthritis or severe osteoporosis.

**Cellulitis** - Patients should be excluded if they have severe pain (possible deep infection), tissue necrosis, neck abscess, peripheral vascular disease, foreign bodies, bite wounds, and specific locations (hand, orbit, joints, scrotum, neck).\(^6^9\) Often immunocompromised are also excluded. A goal of observation of selected patients is to monitor for rapidly progressing cellulitis or necrotizing fasciitis. Inpatient admission is most likely for patients that are female or whose WBC are over 15,000.\(^7^0\)

**Pyelonephritis** - A successful discharge of patients admitted to an EDOU after two doses of intravenous antibiotics over 12 hr was reported.\(^7^1\) The EDOU uncomplicated pyelonephritis patients over 65 had admission rates that were higher than younger patients but still reasonable for an EDOU setting.\(^1^1\)

**Treatment of painful conditions**

Pain is the most common complaint of patients presenting to the ED.\(^2\) There are patients whose cause of their pain cannot be determined during the usual ED visit and who require pain relief and continuing diagnostic interventions. It is for these groups of patients that the EDOU provides the best site of care. No studies have been done relative to the use of EDOUs in the management of painful conditions. The EDOU can provide multiple services that improve pain management, including a quiet and less stressful environment, comfortable beds, and distractions, such as television and refreshments. It is also an easier site to implement a pain management plan, perform patient controlled analgesia, and obtain consultation from specialists should they be needed.\(^7^2\)

**Patients at risk for self-harm**
It is recommended for drug overdose patients to be observed in the hospital. EDOU is used for initial decontamination procedures for mild poisoning or overdoses. Antidote administration, monitoring of serum drug levels and social and psychiatric management is also provided. A risk stratification nomogram for acute acetaminophen toxicity was developed, which is used to identify a low-risk patient population who are ideal for 20-hr NAC therapy. The Mayo Clinic has developed and implemented an EDOU protocol for drug ingestion in adults. Inclusion criteria for placement in this EDOU protocol were asymptomatic adult patients (age 15 years or older) who presented after known or suspected potentially toxic ingestion. The exclusion criteria were, patients with isolated alcohol intoxication, ingestion of sustained release preparation, chronic drug intoxication, elevated drug levels requiring prolonged medical therapy, end organ toxicity upon arrival, persistent self injurious or violent behavior possessing a serious threat to safety of patient, nursing and staff. Those patients that exhibited high-risk criteria for deterioration after ingestion of an antidepressant were also excluded.

Conclusion

The EDOU continues to be a critically important tool used by emergency physicians in the care of selected acutely ill and injured patients. The proper utilization of these units remains important in order to achieve the beneficial outcomes that may be associated with these units. This aspect of emergency medicine merits further support as its role in the health care system continues to be refined and expanded.

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