01

## Survival or Safety: Balancing act with Colistin – A case series

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**Context:** Colistimethate sodium (CMS) is experiencing a renaissance as a salvage treatment against multi-resistant Gram-negative bacteria in critically ill patients. **Aims:** To understand safety outcomes with CMS and its correlation with dosing strategy in real world settings of Indian ICU. **Methods and Material:** Retrospective case series was carried out t in patients with MDR Gram negative infections at 2 tertiary care hospitals in India. Those on CMS for atleast 72 hrs were included in study. Statistical analysis were performed using SPSS version 21.0 software. **Results:** Data from 25 patients was analyzed during 6 months period (Mar'14 – Aug'14). Lower respiratory tract infections (LRTI) including Ventilator associated pneumonia (VAP) and complicated urinary tract infections (cUTI) were present in 60% and 24% cases respectively. *Acinetobacter baumannii* (36%) was most common isolate followed by *Klebsiella pneumoniae* (24%). 88% cases received CMS 9 million international units (MIU) as loading dose. Mean duration of CMS therapy was 9 days. Combination therapy was employed in 19 cases (76%) with carbapenems (56%) as most preferred choice. Acute kidney injury (AKI) was observed in 9 (37.5%) patients post therapy. Rise in Sr. creatinine was statistically significant (P=0.028) in group with high baseline Sr. creatinine. $PaO_2/FiO_2$ ratio showed favorable changes in 6 out of 9 VAP (66%) cases post CMS therapy. A favorable clinical outcome noted in 23 (92%) cases. **Conclusions:** CMS loading dose was associated with favorable clinical outcome. Tailoring of CMS dose based on serum creatinine levels as maintenance strategy is further likely to reduce the burden of AKI. **Key-words:** Colistimethate sodium, Loading dose, Acute Kidney Injury, $PaO_2/FiO_2$ ratio.

**Table 1: Pre and post CMS $PaO_2$: $FiO_2$ index comparison in VAP cases**

| VAP cases | Baseline $PaO_2$: $FiO_2$ index | Post CMS $PaO_2$: $FiO_2$ index |
|---|---|---|
| 1 | 63 (ARDS) | 53 (ARDS) |
| 2 | 82 (ARDS) | 150 (ARDS) |
| 3 | 143(ARDS) | 200 (ALI) |
| 4 | 230 (ALI) | 330 (Normal) |
| 5 | 220 (ALI) | 360 (Normal) |
| 6 | 275 (ALI) | 380 (Normal) |
| 7 | 280 (ALI) | 366 (Normal) |
| 8 | 260 (ALI) | 350 (Normal) |
| 9 | 280 (ALI) | 340 (Normal) |
| 10 | 222 (ALI) | NR |

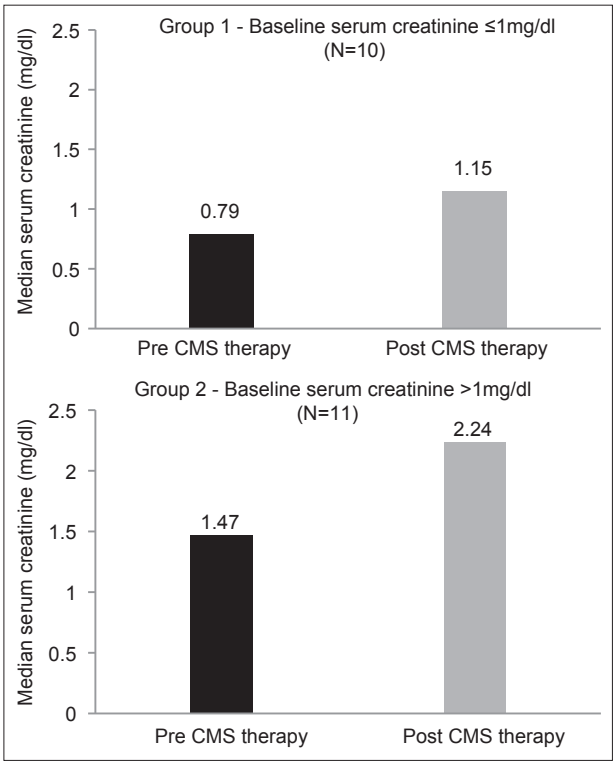


**Fig 2: Changes in serum creatinine in cases who received loading CMS dose (*N*=22)**

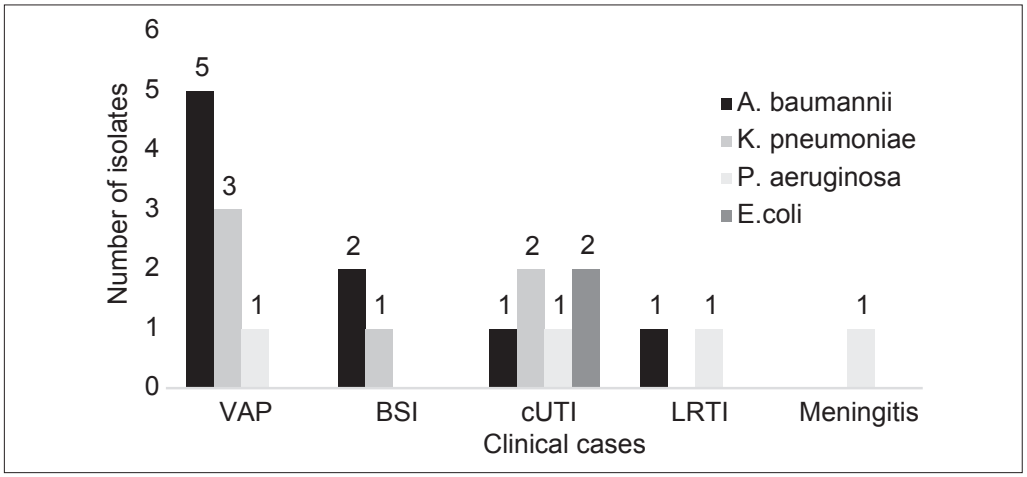


**Fig 1: Distribution of pathogens according to infectious episodes**

02

## Prescription event monitoring of doripenem therapy in management of serious infections

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**Abstract: Background:** Carbapenems are considered to be mainstay of empirical therapy for hospitalized patients with serious infection. Doripenem, the newest agent in this class, was recently approved for the treatment of complicated intra-abdominal infections and complicated urinary tract infections. Several features and characteristics of Doripenem broaden its antimicrobial spectrum beyond that of other carbapenems **Objectives:** This survey was aimed to determine usage profile of Doripenem and physician's clinical experience with it in the management of serious infections. **Methods:** This survey was based on the clinical experience of 100 randomly selected physicians in the management of serious infections from different parts of India. Prescription Event Monitoring (PEM) Forms comprising of various questions were filled up by these physicians. Data from 666 patients were analyzed. **Results:** 548 patients having serious infection admitted in intensive care unit (ICU) infections. The mean age in years of enrolled patiens was 52.27 yrs of which 70.71 % were males and 29.29 % were females. The most common indication for Doripenem being sepsis (43.93 %) and complicated intra abdominal infections (cIAI) 25.63 %. Of cIAIs Peritonitis/ anastomosis (24.81 %) and Pancreatitis (24.06 %) were most common indications. 55.56 % patient had normal renal function and dose of 500mg, 1 hr. infusion every 8 hrly was administered in 89.18 % patients. *E.coli* (95.71 %) and *Pseudomonas aeruginosa* (93.41 %) were most susceptible pathogens whilst *Acinetobacter baumannii* (18.52 %) *and Proteus mirabilis* (14.58 %) were most resistant forms. 92.78 % patients were effectively managed with Doripenem therapy. **Conclusion:** Serious infections in ICU like sepsis and cIAI, due to E.coli, *Pseudomonas aeruginosa* were effectively managed with Doripenem therapy. **Key words:** Doripenem, complicated Intra-Abdominal Infections (cIAI), Pancreatitis, Intensive Care Unit (ICU)infections, *Acinetobacter baumannii*, and *Pseudomonas aeruginosa.*

03

## Comparison of clinical utility of three different methods of abg analysis in picking up hidden complex acid base disorders in critically ill patients

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**Introduction:** We studied three diagnostic approaches of arterial blood gas acid base analysis, one relying on plasma bicarbonate concentration and anion gap without correction for albumin, second relying on plasma bicarbonate and anion gap corrected for albumin, and the third method based on physicochemical principles called the Stewarts approach, comparing their values in detecting complex metabolic acid–base disturbances in critically ill patients. The first and the second approach which uses bicarbonate without and with albumin corrected anion gap does ascribe an explicit role to abnormal concentrations of plasma non-bicarbonate buffers in the pathogenesis of non- respiratory (metabolic) acid–base abnormalities. Hypoalbuminemia is a common finding in critically ill patients; it may confound the customary interpretation of acid–base data, owing to the contribution of albumin to plasma's acid–base equilibrium. In particular, in the diagnostic system relying on plasma [HCO3], hypoalbuminemia is known to cause uncertainty in the interpretation of the Anion gap; if the Anion gap is adjusted for abnormal albumin concentration, its usefulness improves (second approach). Stewart's approach to acid–base chemistry is based on a mathematical model of plasma that has been validated by experiments *in vitro*. This alternative approach is the application of basic physicochemical principles of aqueous solutions to blood. **Materials and Methods:** This prospective observational study to compare different approaches of ABG analysis was conducted at Tata Memorial Cancer. We included 500 arterial blood gas samples, and serum biochemistry profile (electrolytes, phosphates, proteins, urea, uric acid, creatinine) From the measured pH and PCO2, [$HCO3^-$] was calculated by the ABG machine using the Henderson-Hasselbalch equation. Anion gap was calculated as

ANION GAP = [Na+ ] - ([Cl-] + [HCO3-]). (meq/l)
Anion gap was and adjusted for the effect of abnormal albumin concentration with the formula:
AG CORRECTED (meq/l) = AG OBSERVED + 0.25 *([normal albumin]- [observed albumin]) (gm/l).
DELTA GAP was calculated as = Deviation of anion gap from normal
(measured AG-normal AG)-Deviation of HCO3 from normal (24-[HCO3])
Ready calculator was used for third interpretation of the blood gas with Stewarts approach.
A proportion of additional diagnoses were calculated.

**Results:**

| 500 ABG samples | Stewarts v/s traditional 7 step approach (%) | Stewarts v/s albumin corrected traditional approach (%) |
|---|---|---|
| Extra metabolic disorder | 331 (66.2) | 181 (36.2) |
| Missed disorder | 19 (3.8) | 22 (4.4) |
| A different disorder picked up | 147 (29.4) | 41 (8.2) |
| Additional respiratory disorder | 74 (14.8) | 73 (14.6) |

**DISCUSSION:** Thus we have demonstrated that Stewart approach is better than both the traditional approaches. The albumin corrected approach comes closest to the Stewart approach, so if a ready calculator for Stewart approach is not available instead of using the basic 7 step approach, at least the albumin corrected 8 step approach should be used.

04

## Feasibility and effectiveness of a MRI based protocol for acute stroke thrombolysis and intervention: Experience of a Tertiary Care Centre

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**Introduction:** Acute ischemic stroke management saw a paradigm shift in 1995 when the National Institute of Neurological Disorders and Stroke (NINDS) USA confirmed significant short and long term benefits of IV recombinant tissue plasminogen activator (rt-PA) therapy in treatment of acute ischemic stroke. Though the NINDS study protocol was CT based, subsequent studies have shown that MRI in acute stroke settings, has higher sensitivity and specificity. We studied the feasibility and effectiveness of a MRI based protocol for acute stroke thrombolysis at a tertiary care centre. **Methods:** Data of patients who underwent thrombolysis and/or interventional therapy at our centre for acute stroke between April 2013 to August 2014 under FAST (Fortis Acute Stroke Treatment) protocol was retrospectively analyzed. Patients who presented within 6 hours of onset of stroke like symptoms were included in the protocol. Inclusion and exclusion criteria for thrombolysis was as per AHA stroke guidelines. Parameters studied were door to needle time, stroke subtype, modality of treatment, cause(s) for non thrombolysis, cause(s) of delay in execution of protocol. Tabulated results were analyzed. **Results:** In the present study FAST code was activated in a total

of 86 cases, of which 63.95% (n=55) had acute ischemic stroke, 18.60% (n=16) hemorrhagic stroke and 17.44% (n=15) had normal imaging study. Due to various contraindications for MRI, CT was done in 9 cases. Out of total 86 cases, 18.60% (n=16) underwent active intervention (Intravenous (IV) and/or endovascular therapy). In acute ischemic stroke category a total of 29.09% (n=16) had active intervention of which 75% (n=12) was IV rt-PA therapy, 18.75% (n=3) was endovascular therapy (intra-arterial (IA) and mechanical therapy) and 6.25% (n=1) was bridge therapy (IV, IA and mechanical therapy).Target time of 15 minutes for shifting to MRI was achieved in 88.37% (n=76) cases. In 11.63% (n=10) cases, delay in shifting was due to need for initial intubation and stabilization. In 100% cases MRI reporting was achieved in target time of 25 minutes. Target door to needle time of 60 minutes was achieved in 87.5% (n=14) cases. In 12.5% (n=2) cases this target was missed due to delay in getting consent for thrombolysis. **Discussion:** We conclude that a MRI based protocol for acute stroke thrombolysis is feasible with proactive coordinated efforts of a multidisciplinary team. Faster MRI reporting time also makes it effective, in providing time sensitive therapy to a larger number of potentially eligible patients. The results of the present study is based on a small sample size and single centre experience and requires revalidation in a multi centre study for its widespread applicability.

**05**

## QTC interval prolongation and its effect on outcome of the septic ICU patients

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**Introduction**: QTc interval prolongation is commonly seen in the ICU Septic patients since these patients are exposed to multiple risk factors which can cause QTc prolongation. Our study correlate QTc prolongation and its effect on length of stay and outcome of ICU patients. **Materials and methods**: In a prospective observational study conducted in single tertiary hospital between march-december 2013. Patients having sepsis admitted in ICU were included. These septic patients were divided into two groups, one group having normal QTc interval on ECG (electrocardiogram) and other group with prolonged QTc interval. The ICU duration of stay and associated mortality has been observed during their stay. **Results:** In our study 155 patients with sepsis have been included. Among these 129 patients had normal where as 26 patients had prolonged QTc interval on 12 lead ECG. The incidence of QTc prolongation was 16.7% (26/155). The APACHE (8.67 ± 5.53 Vs 13.46 ± 5.88), SOFA (2.35 ± 2.08 Vs 5.42 ± 3.26) and ICU duration of stay (92.92 ± 19.84 Vs 157.26 ± 52.53 hours) were statistically significant ($p<0.05$) in patients with prolonged QTc interval whereas the ICU mortality (14 deaths / 129 patients Vs 5 deaths / 26 patients) was not statistically significant. Drug induced QTc prolongation was common risk factor in our study. **Discussion:** We conclude that Sepsis with QTc interval prolongation has been associated with longer duration of ICU stay without significant increase in mortality. Early detection and or reduction of risk factors causing QTc interval prolongation can shorten duration of ICU stay.

**06**

## Serum albumin as an independent prognostic indicator of mortality and morbidity in intensive care units

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**Designation:** *Professor*

**Introduction:** Hypoalbuminemia (Serum Albumin<3.5g/dl) has been reported to be linked with poor outcomes such as mortality, morbidity, and increased durations of hospital stay- both intensive care unit (ICU) stay and total hospital stay. The present study aims to ascertain the correlation of hypoalbuminemia with mortality and morbidity and to assess the usability of serum albumin as independent prognostic indicator of mortality and morbidity in intensive care units. **Methods:** The study is a single institution, prospective, case control study of 250 patients admitted between May to September 2014 in the medical ICU at MVJ Medical College and Research Hospital, a tertiary care teaching hospital in rural Bangalore. Patients admitted for poisoning, animal/ insect bites and patients discharged against medical advice (DAMA) were excluded from the study. Patient data was sequentially collected and based on the Serum Albumin level at admission, patients were labelled as Hypoalbuminemic (Serum Albumin <3.5g/dl), and Normoalbuminemic (Serum Albumin ≥3.5g/dl) who were analysed as the control group. **Results:** 28/125 (22.4%) hypoalbuminemic patients died in comparison to 10/125 (8%) controls (OR: 3.31, CI: 0.24 to 1.28; p=0.0015). An inverse relation between serum albumin levels and mortality was observed, i.e. lower the serum albumin, higher the odds of death. Patients with an admission serum albumin of between 2.5- 1.5g/dl had higher odds of death compared to those with a serum albumin between 2.5- 3.5 g/dl (OR: 6.32, CI: 0.21 to 1.81; p=0.0004). 60 % of deaths within 24 hours of admission were seen in hypoalbuminemic patients with admission serum albumin between 2.5 - 1.5g/dl. Hypoalbuminemics had longer durations of ICU stay and total hospital stay. Average ICU stay of 3.856±2.83 days versus controls 2.712±2.04 days (p=0.0003). Total hospital stay in hypoalbuminemics was 7.592±5.02 days versus 5.936±3.77 days in controls (p=0.0035). Sepsis was attributed as the cause of death in 61% of hypoalbuminemics. Mortality was 100% in hypoalbuminemics with serum albumin <2.5g/dl versus 55.56% in those with serum albumin between 2.5-3.5g/dl. **Discussion:** The present study indicates that serum albumin can be used as an independent prognostic indicator of mortality in intensive care units. Further studies are required to elucidate if a reducing trend of serum albumin levels is a better prognostic indicator of mortality and morbidity in the critically ill rather than a single value.

**07**

## Systemic barriers and interventions to bring down the turn around time to first dose antibiotics in sepsis patients

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**Introduction**- Early administration of Antibiotics (<45 minutes) in sepsis patients is directly related to improved clinical outcome. The aim of the study was to identify systemic barriers to first dose of antibiotics in sepsis patients. **Methods**- A quasi-experimental study was done in an Emergency Department of a tertiary care Hospital in Kolkata from October to December 2013 **in order to identify the turnaround time to first dose antibiotics in sepsis patients with a goal to keep the turnaround time <45 minutes from antibiotic prescribed. Patients selected were based on initial admission diagnosis of sepsis by the Emergency Physician**. Root Cause Analysis (RCA) was done, barriers identified, interventions developed & implemented (January- March 2014) and goal was compared pre (2013) and post intervention (2014). **Results**- Initial analysis was done on a sample size of 75 antibiotic prescriptions, all prescriptions was screened and analyzed. 60 out of 75 antibiotic prescriptions (80%) did not meet the set turnaround time goal of <45 minutes. RCA identified several barriers including use of manual hand written system for antibiotic indent, lack of awareness about importance of timing among staffs, lack of communication among stake holders, lack of a well defined process flow for indenting, logistic issues (not available in pharmacy), lack of proper surveillance, corporate clearance issues. Interventions developed and implemented - including procuring Electronic Indent System with STAT option, developing

hospital antibiotic policy, educational training of staffs, create a well defined process flow, keeping a stock of commonly used antibiotics in ICU, forming a team to monitor surveillance, regular audits and performance comparison. The Mean±SD time for first dose of prescribed antibiotics to drug administration in pre intervention phase was 155± 42 minutes while following implementation of interventions the Mean±SD time was substantially reduced to 43±6 minutes. Further audits showed significant increase in first dose of antibiotic prescriptions meeting the turnaround time goal of <45 minutes (>75%). Finance & Corporate clearance issues related to expensive antibiotics is still an issue for selected groups of patients affecting turnaround time as a whole. **Conclusion**- Barriers identified needs Root Cause analysis and intervention but it has to be followed up with continued surveillance and comparison of quantifiable quality indicators to make it sustainable. **Limitations**: Time lag between the first dose antibiotic prescription in card and Electronic indenting is system may affect overall turnaround time RCA focused on multiple interventions put together hence effectiveness of each intervention separately is not defined.

**08**

## Payment options- do they affect outcome in critically ill

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**Introduction:** Increasing cost is an important issue in critical care medicine. We tried to analyse in a level 3 Care ICU in Kolkata of a tertiary care hospital, whether the different payment options (self- paying vs. insurance/corporate paying) do affect the outcome in a critically ill. **Methods**: Our Prospective study included 1520 patients admitted consecutively in a Level 3 Care ICU for a period of 20 months. Readmitted patients during the same period were excluded. Payment method was documented for all and divided into two groups as self-paying and insurance/corporate- paying. Outcome assessment was done using APACHE IV model for all cases. Demographic data, number of observed deaths, Predicted Mortality Rate (PMR), Standardized Mortality Ratio (SMR), Average Length of Stay (ALOS), Predicted Length of Stay (PLOS), Number of DAMA (Discharge against Medical Advice) was documented for each group. Statistical analysis was carried out using unpaired Student t test and p value < 0.05 was considered significant. **Results**: Of 1520 patients, 995(65.46%) cases were self-paying while 525(34.54%) cases were insurance/corporate paying. In Self- paying group- Mean age was (59.65 years±17.26 SD) [Median 62], A4 Score Mean was (62.50±33.61 SD) [Median 57], Average LOS (4.67 days±4.29 SD) [Median 3], Predicted Mortality rate was 22.71, 226 observed deaths, 85 cases of DAMA, SMR was 1.00 (CI .87-1.14). In Insurance/Corporate-paying group- Mean age was (61.75 years±17.19 SD) [Median 65], APACHE IV Score Mean was (58.53±32.94 SD) [Median 54], Average LOS was (5.64 days±5.61 SD) [Median 4], Predicted Mortality rate was 21.26, 113 observed deaths, 6 cases of DAMA, SMR was 1.01(CI .83-1.21). In the two compared groups-Predicted Mortality and SMR (Standardized Mortality Ratio) was not statistically significant (p=0.2808), however ALOS in the insurance/corporate paying group was significantly higher than the self- paying group (p value equals 0.0002), mean age of the insurance/corporate paying group was significantly higher than the self- paying group (p value equals 0.02), incidences of DAMA is significantly higher in self- paying group (8.54%) as compared to insurance/corporate paying group (1.14%). Root cause Analysis showed DAMA cases are mostly financial (>95%). **Conclusion**-Statistically significant differences in ALOS and DAMA in the two groups are probably due to "Cost of healthcare not affordable to all". **Limitations**-Sample size was adequate but distribution size of two groups was not equal, DAMA patients were not followed up which can affect SMR in both groups (self-paying> insurance paying).

**09**

## Using standardized mortality ratio (SMR) as a measure of ICU performance- is it adequate?

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**Introduction**: Standardized Mortality Ratio (SMR) is an important quality measure of ICU performance. This is calculated by dividing observed deaths by predicted deaths and a value≤1 is considered as standard goal. We conducted a prospective study in a level 3 Care ICU in Kolkata of a tertiary care hospital to analyse the unit performance based on SMR and its variation in different subgroups concerned. **Methodology:** 942 patients admitted consecutively in a level 3 ICU over one year were included. Readmitted patients were excluded and diagnosis on admission in ICU was noted. Subgroups were made based on admission diagnosis. Demographic data, SMR with 95% confidence interval determined for the entire group and the subgroups and analysis done. (Using unpaired student t test and p value<.05 was considered significant). **Results**- In the Entire group, Mean age was 60.69 years± 16.41SD (Median 62.5), Mean A4 was 61.17±32.45SD (Median 56), PMR was 22.60 and SMR 0.996 (CI 0.87-1.14). Subgroup analyses based on admission diagnosis done, In Sepsis subgroup Mean age was 63.31 years± 14.24SD (Median 65), Mean A4 was 77.56±32.61SD (Median 72), PMR was 32.60 and SMR 0.98 (CI 0.78-1.2). In Renal subgroup Mean age was 62.10 years± 15.30SD (Median 65), Mean A4 was 60.76±25.06SD (Median 60), PMR was 17.34 and SMR 0.95 (CI 0.47-1.69). In GI subgroup Mean age was 54.89 years± 17.26SD (Median 57.5), Mean A4 was 53.35±30.22SD (Median 49.5), PMR was 17.71 and SMR 1.18 (CI 0.78-1.7). In Pulmonology subgroup Mean age was 63.19 years± 18.10SD (Median 63.5), Mean A4 was 51.14±23.70SD (Median 48.5), PMR was 18.44 and SMR 0.98 (CI 0.62-1.54). In Cardiology subgroup Mean age was 61.91 years± 14.10SD (Median 62), Mean A4 was 56.27±33.08SD (Median 50), PMR was 20.81 and SMR 0.92 (CI 0.64-1.27). In Hemato-oncology subgroup Mean age was 59.49 years± 19.39SD (Median 63), Mean A4 was 60.71±32.49SD (Median 54), PMR was 18.56 and SMR 1.08 (CI 0.57-1.84). In Neurology subgroup Mean age was 58.84 years± 18.36SD (Median 65), Mean A4 was 59.92±31.64SD (Median 53), PMR was 27.20 and SMR 0.99 (CI 0.68- 1.44). In Ortho subgroup Mean age was 55.56 years± 19.45SD (Median 62), Mean A4 was 35.59±17.18SD (Median 36), PMR was 4.84 and SMR 1.05 (CI 0.45-2.41). Age was statistically significant only in sepsis subgroup (p=0.0163), Ortho subgroup (p=0.021) and GI subgroup (p=0.0002) while A4 scores were statistically significant in sepsis subgroup (higher p<0.0001) and Ortho subgroup (lower p<0.0001). SMR varied in subgroups and the entire group, with worst in GI subgroup (1.18 vs. 0.996) and in Ortho subgroup being statistically significant (1.05 CI 0.45-2.41). **Conclusion**- Using SMR to analyse an entire group is useful but has limitations, focused subgroup analysis is important. **Limitations**- Sample size varied substantially in subgroups.

**10**

## Source of ICU admission- Does it really matter? An analysis

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**Introduction:** Source of Admission in Intensive Care Unit (ICU) is of import. We tried to identify the different sources of ICU admission in a level 3 ICU of a tertiary Care Hospital in Kolkata and analyze whether the overall patient outcome is affected by the different sources of admission. **Methodology**: Our prospective study included 2056 patients admitted in a level 3 Care ICU over a period of two years.

Numbers of readmissions were not considered. ICU outcome was analyzed using APACHE IV model and source of admission to ICU was documented as either from Emergency (ER), from Floor or from Other Hospital. Analysis was carried out between different groups based on admission using unpaired student t test and p value<.05 was considered significant. Number of Ventilations and mortality rate in each group was also documented. **Results**: Of 2056 admissions-1223 cases (59.48%) were from Emergency(ER), 809 cases (39.35%) were from Floor and 24 cases (1.16%) were from Other Hospitals. In the ER **group** mean A4 was 55.03±31.49SD (Median 50), PMR 16.26, Observed deaths 198, ALOS 4.78days±4.83SD (Median 3), SMR 0.995 (CI .86-1.14), Mean Age 60.52years±17.63SD (Median 63), 323 ventilations. In the **Floor group** mean A4 was 65.17±34.40SD (Median 60), PMR 27.03, Observed deaths 234, ALOS 5.23days±5.22SD (Median 3), SMR 1.07 (CI .94-1.21), Mean Age 61.38years±15.72SD (Median 64), 302 ventilations. In the **Other Hospital** group mean A4 was 55.29±29.82SD (Median 50), PMR 18.0, Observed deaths 2, ALOS 6days±5.85SD (Median 3), SMR 0.46 (CI .23-.88), Mean Age 56.08years±17.79SD (Median56.5), 6 ventilations. **During analysis, Other Hospital group was omitted because of inadequate sample size. There was statistically significant differences in A4 (Floor>ER p<0.0001), PMR (Floor>ER p<0.0001), ALOS (Floor>ER p=0.04) noted between the Floor and ER group.Number of Ventilations (37.33% vs. 26.4%), SMR (1.07 vs. 0.995), Mortality rate (28.92% vs. 16.19%) was also significantly higher for patients admitted from Floors. No significant statistical difference was observed in age between two groups (p=0.26). Conclusion**:Severity of Illness Index in patients admitted to ICU from Floors is significantly higher than Emergency admissions. **Overall outcome for patients transferred to ICU from Floor is worse based on mortality rate, SMR, ALOS when compared to Emergency admission group**. **Limitation**:The sample size of the Other Hospital group was inadequate hence not considered for analysis. Pre-ICU scores for patients transferred from Floor and Other Hospital were not avialable.

**11**

## Survey on management of severe Intensive Care Unit (ICU) infections: Clinical experience with Imipenem+ Cilastatin

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**Abstract: Background:** Imipenem + cilastatin is appropriately used for the early, timeous treatment of severe nosocomial infections in the critically ill patient or in the critical care setting, particularly when no other antibiotic appears to be suitable, or is available. Imipenem + Cilastatin (Cilanem) was the first carbapenem antibiotic selected for development more than two decades ago because it was a highly potent, broad-spectrum antimicrobial agent with a good safety profile. **Objectives:** This survey was aimed to determine usage profile of Imipenem + Cilastatin and physician's clinical experience with it in the management of severe ICU infections. **Methods:** This survey was based on the clinical experience of 52 randomly selected physicians on an aggregate patient basis in the management of severe ICU infections from different parts of India. Prescription Event Monitoring (PEM) Forms comprising of various questions were filled up by these physicians. Data from 666 patients were analyzed. **Results:** Of 666 patients having severe ICU infections 61.76 % were males and 38.24 % were females, average age in study population was 51. 14 yrs. Physicians observed that 92.49 % of the patients were effectively managed with Imipenem + Cilastatin. Most common indication for Imipenem + Cilastatin therapy was Sepsis (35.27 %), followed by complicated intra-abdominal infections (cIAI) in 24.43 %. In cIAI most common indication for administration of Imipenem + Cilastatin combination was pancreatitis (30.19 %). Renal function was normal in 50.91 % of patients admitted in ICU for severe infections. According to antibiotic sensitivity report, infections due to *E.Coli* were most susceptible (94.65 %) followed by *Klebsiella pneumoniae* (81.87 %). Most resistant infections were due to *Proteus mirabilis* (19.28 %). **Conclusion:** Severe ICU infections caused by multi drug resistant gram negative bacterial infections like *E. coli, Acinetobacter baumannii, Pseudomonas aeruginosa, Klebsiella pneumoniae* and *Proteus mirabilis,* were effectively managed with Imipenem+ Cilastatin. **Key words:** complicated Intra-Abdominal Infections (cIAI), Pancreatitis, Imipenem + Cilastatin, Intensive Care Unit (ICU) infections, *Acinetobacter baumannii, Pseudomonas aeruginosa*

**12**

## Stevens-Johnson syndrome - Review of recent culprit drugs and treatment options in ICU

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**Abstract:** Stevens – Johnson syndrome and toxic epidermal necrolysis (TEN) are rare but severe adverse drug reactions. The exact mechanism of SJS is still not known but primarily it is immunogenic phenomenon, resulting in extensive keratinocyte apoptosis ultimately leading to sloughing of dermal epidermal junction. The commonest aetiology is drugs induced. Most of the patient died due to sepsis and MOF. We present here a series 16 cases of Stevens Johnson syndrome and TEN due to various drugs. On the basis of reported cases we will review the most commonly associated drugs, and treatment options in these severe life-threatening diseases. We will especially discuss the preventive measure of sepsis, controversial role of systemic corticosteroid, immunoglobulin (IVIG) therapy, cyclosporine and the supportive care in intensive care unit.

**13**

## "Open label study of vasopressors in intensive therapy- survival benefits vs side effects"

**Presenting Author:** Dr Akshat Pandey
**Co-author:** Dr Santosh Padhy, Dr Arvind Mittal, Dr R K Jha

**Background** Physicians have several options to choose from when instituting vasopressor therapy for patients in shock. Amongst them, norepinephrine and dopamine are two most frequently used molecules as first-line therapy. Physiologic models have been proposed, suggesting superiority of one over the other, but neither has consistently shown to be advantageous. However, few randomized studies have addressed the issue of which vasopressor produces better outcomes than the other in management of shock. **Methods:** We conducted this study in four intensive care units, General ICU, Medicine ICU, Surgical ICU and Cardiac ICU for more rational case mix, at SAMC & PGI, Indore, from 1st August 2013 to 31stNovember 2014.. Total 1046 patients requiring a vasopressor were randomized, received either dopamine, started at a dose of 5 mics/kg/min which could be increased incrementally to a maximum dose of 20 mics/kg/min, or Norepinephrine, started at 0.02 mics/kg/min and increased to a maximum dose of 0.12 mics/kg/min. Both Dopamine and Norepinephrine solutions were administered from open label. **Results** After 1, 046 patients, study enrolment was halted because of a predefined stopping rule that met the criterion for futility (i.e a lack of difference between the two study drugs for the primary end point of 28-day mortality). The 28-day mortality in the dopamine group was 51.6%, compared to 47.2% in the Norepinephrine group ($p$ = 0.10). No significant difference was found in mortality rates in the ICU, in the hospital, or at 6 or 12 months follow up. The baseline characteristics of the two groups were similar. The case mixing of study population was 58% Sepsis & 32% Cardiogenic shock and rest 10% were other distributive, obstructive and Hypovolemic shock. The baseline characteristics listed amongst the subgroups appear to be similar. No analysis was conducted

to ensure that two potentially important confounding treatment variables, initiation time of appropriate antibiotics for patients with septic shock and the rate of use of thrombolytics for patients with acute myocardial infarction. Accepting these limitations, those patients with cardiogenic shock had an increased rate of death if randomized to the dopamine group and were found to have a significantly increased risk of developing arrhythmias compared to the Norepinephrine group (26.1 % v. 14.4%; $p < 0.001$). As well, more people on vasopressor support were free at 2 weeks in the norepinephrine group than in the dopamine group ($p = 0.01$). **CONCLUSION** The study showed No significant difference in the primary end point, death at 28 days. Concerns were addressed about Dopamine therapy due to increased rate of arrhythmias and increased mortality in the subgroup with cardiogenic shock.

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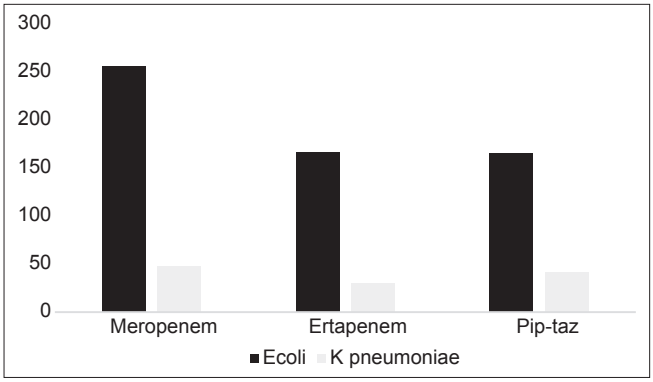
## Comparative *in vitro* activities of meropenem, Ertapenem and piperacillin –Tazobactam against urinary *Escherichia coli* and *Klebsiella pnemoniae* isolates from South India

**Presenting author:** Dr. Dorairajan Sureshkumar

**Background:** Group 2 carbapenem like meropenem was the initial antibiotics of choice for most of the patients admitted with urosepsis. Ertapenem was considered better de-esclation option over beta-lactam (BL) beta-lactamase inhibitor (BLI) combinations for resistant *Enterobactreriaceae* infections due to its better sensitivity pattern. However, increasing resistance to ertapenem for *Enterobacteriaceae* was reported from different countries. The aim of the present study was to evaluate the *in vitro* activities of meropenem, ertapenem and piperacillin-tazobactam (pip-taz) against *Escherichia coli (E.Coli)* & *Klebsiella* pneumoniae (KP) urinary isolates in South India. **Methods**: We evaluated the *in vitro* susceptibility of urinary E.coli & Klebsiella isolates to meropenem, ertapenem and piperacillin-tazobactam (Pip-taz) for a period of 6 months from January to June 2014 in a tertiary care referral hospital in South India. The identification & antibiotic susceptibility testing were performed by the BD PhoenixTM 100 (Becton Dickinson, MD, USA) fully automated microbiology system according to the 2014 CLSI guidelines. **Results:** A total of 391 non-duplicate urinary isolates of E.coli (284) and K.pneumoniae (107) species were isolated during the study period. Their susceptibility rates of meropenem, ertapenem & pip-taz were shown in table-1

Table-1: Sensitivity pattern of meropenem, ertapenem & Pip-taz against Urinary isolates




Ertapenem (58.54%) and pip-taz (58.09%) had similar sensitivity against *E.coli*, however, pip-taz (38.31%) was more susceptible than ertapenem (28.03%) against *K pneumonia* isolates in this study. **Conclusion:** There is a huge difference in the susceptibility between meropenem (90.01%) and ertapenem (58.54%) against *E.coli* urinary isolates. Piperacillin –tazobactam (38.31%) is nearly equal to meropenem (44.85%) & better than ertapenem (28.03%) for urinary *Klebsiella* isolates. This finding should be confirmed in large multi-center studies to create better de-escalation practices in India.

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## Urine output and serum creatinine do not predict outcomes in acute kidney injury patients on haemodialysis. A single centre study

**Presenting Author:** Dr. Varalakshmi D.
**Co-author:** Dr. T Suhasini, Dr. Shaik ArifPasha

**Introduction:** Acute kidney injury is an independent risk factor for increased mortality and morbidity in the intensive care unit. It has been found that patients on maintenance haemodialysis for chronic kidney disease with higher residual renal output had better perioperative outcomes. In a study on 16, 677 adult patients, using multivariate logistic regression, it was found that urine output alone was a better outcome predictor than creatinine alone or the combination of both. We observed the contrary in terms of urine output and evaluated the same in acute kidney injury patients who underwent haemodialysis in our ICU. **Methods:** Medical records of 38 adult patients who underwent haemodialysis for acute kidney injury during a 9 month period from March to November 2014 in a single centre intensive care unit were reviewed. Patients who received diuretics were excluded from the analysis. Demographic information, laboratory results, charted data, discharge diagnoses, physiological data, and patient outcomes were tabulated. **Statistical Analysis:** 38 Dialysed patients were classified into two groups based on outcomes as death group and improved group. The mean serum creatinine and mean urine output on the first four days of admission to the intensive care unit in both the groups were compared. Logistic regression was used to find out if outcomes could be predicted based on the measured parameters, urine output and serum creatinine in the study patients

**Results:**

**Comparison of serum creatinine in the two groups**

| Out come | *n* | Mean serum creatinine | SD | *T* value | *P* value | Decision |
|---|---|---|---|---|---|---|
| Day-1 | | | | | | |
| Improved | 25 | 4.3400 | 1.82186 | 0.870 | 0.39 | N.S |
| Death | 13 | 4.8923 | 1.92244 | | | |
| Day-2 | | | | | | |
| Improved | 23 | 4.3261 | 1.82638 | −1.274 | 0.211 | N.S |
| Death | 13 | 5.2692 | 2.60525 | | | |
| Day-3 | | | | | | |
| Improved | 19 | 4.1263 | 1.68748 | −0.334 | 0.740 | N.S |
| Death | 12 | 4.3500 | 2.00431 | | | |
| Day-4 | | | | | | |
| Improved | 16 | 3.8688 | 1.84272 | −0.046 | 0.963 | N.S |
| Death | 11 | 3.9091 | 2.68382 | | | |

**Comparison of urine output in the two groups**

| Out come | *n* | Mean urine output | SD | *T* value | *P* value | Decision |
|---|---|---|---|---|---|---|
| Day-1 | | | | | | |
| Improved | 25 | 586.8000 | 665.38660 | 0.592 | 0.558 | N.S |
| Death | 13 | 462.6923 | 492.07306 | | | |
| Day-2 | | | | | | |
| Improved | 22 | 917.2727 | 701.28577 | 0.39 | 0.969 | N.S |
| Death | 13 | 907.6923 | 724.25713 | | | |
| Day-3 | | | | | | |
| Improved | 18 | 963.9444 | 678.98588 | −0.471 | 0.641 | N.S |
| Death | 12 | 1088.1667 | 748.40337 | | | |
| Day-4 | | | | | | |
| Improved | 16 | 984.8125 | 756.20581 | −1.13 | 0.269 | N.S |
| Death | 11 | 1335.0000 | 841.42439 | | | |

**DISCUSSION:** There was no statistically significant difference between urine output and serum creatinine in the two groups on any of the four days. Logistic regression analysis showed that outcomes could not be predicted based on urine output and serum creatinine. The indications for haemodialysis in the ICU extend beyond the AKI criteria to include hyperkalemia, metabolic acidosis, rhabdomyolysis and pulmonary oedema among many others. The ICU patient population is very heterogeneous with many co morbidities. There are several factors affecting outcomes in this diverse group. Hence other modalities of evaluation need to be investigated to guide intensivists with clinical decision making and prognostication. **CONCLUSIONS:** Urine output and serum creatinine are not accurate predictors of outcomes in patients with acute kidney injury undergoing dialysis. Limitations of this study include a small and heterogeneous study group.

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## Microbiological diagnosis of empyema and parapneumonic effusions: Role of syndrome evaluation system

**Presenting Author:** Dr. Natarajan Rajagopalan,
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**Introduction:** Parapneumonic effusion (PE) and empyema (EM) are common in developing countries. Approximately 20% of patients with community acquired pneumonia develop pleural effusions. In about 30% of these patients, the condition progresses to complicated PE or to EM. Rapid, sensitive and accurate pathogen detection is required for effective antibiotic selection, treatment and good outcome in EM. Although pleural fluid culture is the standard of diagnosis for infectious etiology, prior antibiotic therapy leads to low sensitivity. Globally, culture positivity rates are less than 30%. In this study, we evaluated the efficacy of Syndrome Evaluation System (SES), a multiplex nucleic acid amplification and hybridization based molecular diagnostic platform for diagnosing EM in comparison with culture. We also studied the impact of SES on therapeutic decisions & outcomes. **Methods:** This single center prospective observational study was conducted in our MICU and ward during the period from May 2013 to April 2014. Pleural fluid samples of 31 adult patients, clinically diagnosed with EM and PE, were subjected to routine lab tests. 3 ml of pleural fluid was analysed by SES. Standard therapy was provided to all patients based on diagnostic information from our laboratory and SES. Appropriate statistical tests were conducted to test significance between two variables. P value of <0.05 was considered as statistically significant. **Results:** Mean age & duration of illness was 48.06 years & 24.61 days respectively. Chest X-ray was done for all 31 patients. Depending on the results, subsequent chest ultrasound and CT of thorax was performed on patients as required. SES had 2.6 fold higher sensitivity compared to pleural fluid culture. 16 samples (52%) were positive for pathogens on SES while 6 samples (20%) were positive on culture. SES was 83.33% concordant with culture. Results of SES were available within 24 hours. Prevalence of GNB was 60%. Acinetobacter baumanii was the most prevalent bacterial species detected in 7 samples. Out of the 16 positives detected by SES, 8 were polymicrobials (50%). SES positives were significantly associated with both the severity of the disease as well as employment of more invasive treatment modalities like ICD and decortication. SES negatives had better clinical outcomes with 9 out of 15 patients (60%) clinically improving as compared to 6 out of 16 patients (37.5%) in the SES positives. There were no deaths in the SES negatives as compared to 3 deaths in the SES positives. **Discussion:** Traditionally, GPB have been associated with EM. In our study, the prevalence of GNB was 60%, both by pleural fluid culture as well as by SES. However, 50% of SES positives were polymicrobial in nature. Molecular diagnostics like SES is critical to diagnose and manage PE and EM. In conjunction with cultures, SES will change the way we diagnose critical infections and take therapeutic decisions. This will improve patient outcomes. Larger controlled studies will pave way for in depth and detailed patient outcome based analysis, studying correlations of the biology of disease progression and the etiology, extent and duration of infection and potentially formulate treatment guidelines based on cutting edge diagnosis.

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## Coagulation profile as a progostic biomarker in critically ill patients

**Presenting Author:** Dr. Deepa Sinha, Post-Graduate
**Co-author:** Professor Dr. Nalini Kotekar, Professor and HOD, Dr. Jayshree, Professor, Dr. Vishakantha Murthy, Adjunct Faculty
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**Institute:** *JSS Medical College & University, Mysore*

**Background:** The main aim of this study is to evaluate the prognosis of patient and their association with coagulation profile presented in ICU. Coagulation profiles are routinely done in ICU setups and can serve as relatively inexpensive prognostic biomarker as compared to several expensive sensitive markers. Various studies have been done in the recent years but no study has been done in India to establish the coagulation profile in critically ill patients and it's correlation with morbidity and mortality. This methodology assesses dynamic changes of coagulation parameters i.e. Platelet Count, Activated partial thromboplastin time (aPTT) and International Normalized Ratio (INR) of ICU patients at fixed time intervals. **Method:** An Explorative study with simple random sampling technique without control design was carried out at JSS Hospital Mysore, 51 patients were selected who will fulfilled inclusion and exclusion criteria. Inclusion criteria included all patients admitted in medical and surgical ICUs, High risk patients presenting for emergency and elective surgeries, Patients above 18 years of age. Written Informed consent was taken. Exclusion criteria included patients who did not survive at least 24 hours after admission, patients on anticoagulant therapy and patients with decompensated or end-stage liver disease. Blood samples were taken on Day2, Day5 and Day 10 to measure Platelet Count, Activated partial thromboplastin time (aPTT) and International Normalized Ratio (INR) and co-related with the progression of the disease and condition of the patient. **Result:** 51 patients were analysed and out of which 16 patients died. There parameters showed significant changes by the course of 10 Days. INR was decreased by Day 5 (P=0.049) and significantly by Day 10 (P=0.007), aPTT was significantly decreased by Day 2 (P=0.007), by Day 5 (P=0.004) and by Day 10 (0.003) and platelet count was not significantly reduced. **Conclusion:** Coagulation profile was reduced in patients admitted in ICU and significantly in non-surviving patients and can be used as a relevant biomarker to evaluate prognosis of patients admitted in ICU.

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## Factors associated with early death following out of hospital cardiac arrest

**Presenting Author:** Mohammed Ishaq Ruknuddeen
**Co-authors:** Ramadoss R, Rajajee V, Rajagopalan RE
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**Background:** Out of hospital cardiac arrest is associated with high morbidity and mortality. Many patients die early either following withdrawal of life sustaining treatment (WLST) or due to severe underlying illness. There is limited data on the factors associated with early death following out of hospital cardiac arrest (OHCA) from resource-limited settings.**Aim:** To identify the factors associated with early death following out of hospital cardiac arrest. **Methods:** Retrospective chart review of patients with OHCA surviving more than 24 hours following return of spontaneous circulation between January 2006 and December 2012. Factors associated with early death (≤ 72 hours post- OHCA) were determined using multivariate analyses. Univariate comparisons were undertaken using Fisher's exact or Mann-Whitney U test where appropriate, with factors identified as statistically significant included in a multivariate

generalized linear model to calculate relative risks (RRs) and 95% confidence intervals (CIs). **Results:** Out of the 121 patients surviving more than 24 hours of hospitalization, 104(86%) died and early death was reported in 42 (40.3%) patients. Majority (34/42, 81%) of the early deaths occurred due to severe underlying illness (non-WLST). On univariate analyses, the factors associated with early death were the presence of status myoclonus < 24 hours post-cardiac arrest and absent brainstem reflexes on day 3 post-cardiac arrest. On multivariate analyses, an increased risk of early death was associated with absent brainstem reflexes on day 3 (RR 3.87, 95 % CI 1.12-13.37), but not WLST (RR 0.21, 95% CI 0.11-0.42). **Conclusion:** Absent brainstem reflexes on day 3 post-cardiac arrest was associated with early death following OHCA. Early death was more likely to occur due to underlying illness, rather than due to WLST.

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## A prospective study to assess the incidence of delirium in non - ventilated critically ill patients using validated tool

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**Abstract For Oral Presentation/ Poster Presentation: Introduction:** Delirium is very common in intensive care unit, yet it is unrecognized and understudied. This study was conducted to identify the incidence of delirium in critically ill patients using Confusion Assessment Method for Intensive Care Unit (CAM-ICU). This study also evaluated the presence or absence of delirium with unintentional device removal and clinical outcome in critically ill patient. **Methods:** The prospective, observational study was conducted with 44 patients over a period of five months in the medical ICU. Data collection included all patients with more than 24 hours of ICU admission and age above 18 years. The study excluded patients with history of psychosis or neurologic disease, traumatic brain injury, severe neurological disorders, deaf patients and comatose patients. The presence or absence of delirium in critically ill patients was correlated with the duration of ICU stay and length of hospitalization using independent t- test. Unintentional device removal among patients with or without delirium was correlated using Fischer's exact analysis. **Results:** In our study, 11 (25%) patients were identified to have delirium from a total of 44 patients who were assessed for delirium. Hypoactive delirium accounted for 10 (22.7%) patients and one (2.3%) patient had hyperactive delirium. Risk factors for causing delirium in our study included 3 (6.8%) sepsis, 3 (6.8%) high vasopressor supports, 2 (4.5%) electrolyte imbalance, 1 (2.3%) drug and 5 (15.9%) others. There was statistically significant increase in length of ICU stay and duration of hospitalization in presence of delirium in our study. Unintentional device removal (like feeding tube) was also significantly higher in patients with delirium. **Conclusion:** In this study, we found that delirium among non- ventilated patients in the ICU was associated with longer length of stay. The study highlights the paramount importance in improving detection of delirium to enhance critical care and patient safety. This warrants further studies to determine the need to monitor, prevent and treat delirium in Indian ICUs.

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## Will rise in red cell distribution width from baseline predict mortality in patients with sepsis?

**Presenting Author:** Dr. Ramyajit Lahiri,
**Co-author:** Dr. V. P. Chandrasekharan

**Introduction** Red cell distribution width (RDW) is a measure of variation of RBC volume, done as a part of complete blood count. Studies show association between RDW and critically ill non cardiac and cardiac mortality. We tried to find out whether rise in RDW value from base line prognosticate mortality in sepsis. **Materials and methods** Data collection: This is a prospective study conducted in Vinayaka Missions Medical College Hospital, Salem, Tamil Nadu, between September 2012 and August 2014 Total of 188 patient's data collected. Adult patients with sepsis included and exclusion criteria's are 1) Malignancy 2) Anaemia 3) Myocardial infarction 4) Require blood transfusion within 72 hour 5) Serum lactate level less than 4. Patients in ER received early goal directed therapy. Fluid resuscitation done by ultrasonologically guided inferior vena cava diameter and 2D echo. In Intensive care unit we followed surviving sepsis campaign guideline. RDW value was assessed on admission and after 72 hour. Admission value was considered as baseline. Statistical analysis: Patients were put into two groups – 1). Rise in RDW value from baseline, 2) decreased in RDW from baseline. Mortality for 28 days assessed **Result:** Among 188 patients 79 patients showed raise in RDW and 109 patients decreased in RDW. 53 patients died. Among that 40 patients shows raised RDW (50.63%) and 13 patients decreased RDW (11.93%). 28 day mortality for RDW at baseline 'p' value '0.684' which is not significant. For RDW at 72 hour it was '0.006' which was significant.

| | Actually survived | Actually dead | |
|---|---|---|---|
| Fall in RDW | 96 | 13 | 109 |
| (predicted to survive) | True-negative | False-negative | |
| Rise in RDW | 39 | 40 | 79 |
| (predicted to die) | False-positive | True-positive | |
| Total | 135 | 53 | 188 |

Sensitivity = 75.47%
Specificity= 71.11%
Positive predictive value= 50.63%
Negative predictive value = 88.07%
Accuracy= 72.3%

**Discussion** Increase in RDW from baseline during first 72 hour has a potential predictive value in sepsis. The mechanism is not clear. From different literature we concluded that probably critical illness causes acute disruption in physiological reserve. In septic shock there is profound vasodilatation, release of cytokines and tissue hypo-perfusion ensues. Resulting hypoxia and ischemia drain the physiological reserve which in turn triggers reactive erythropoiesis to augment oxygen carriage. It causes release of immature red blood cells with poor oxygen binding capacity and increasing the RDW. Main pit fall of our study, it can predict after 72 hours. It is a small single centre study. Cardiac ICU patients were not included. Sample size is also a major limitation. **Conclusion** An increase in RDW from baseline during the first 72 hours after hospitalization is significantly associated with adverse clinical outcome in patients with sepsis.

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## Validation of a qualitative molecular diagnostic assay designed for simultaneous detection of viruses, bacteria, fungi and parasite

**Presenting author:** Dr Sunil Govekar

**Abstract:** Many pathogens are known to cause a syndrome. A rapid diagnosis of the etiological agent forms the cornerstone of therapeutic management of the patient. The aim of this study was to validate a qualitative simultaneous multiplex molecular diagnostic assay, Syndrome Evaluation System (SES), developed by XCyton Diagnostics Pvt. Ltd, India. The validation was carried out for the detection of nine DNA viruses (Herpes simplex virus 1 (HSV-1), HSV-2, varicella-zoster virus (VZV), cytomegalovirus (CMV), Epstein-Barr virus (EBV), human herpesvirus 6 (HHV-6), JC Virus, BK virus and Adeno virus), fungi (Candida, Aspergillus and P.jirovecii), a parasite (T.gondii) and for the resistance markers . SES was validated with 134 samples obtained from the European proficiency panels (Quality Control for Molecular Diagnostics [QCMD]; Glasgow. Overall, the sensitivity of SES was much higher than any of the assay for HSV, VZV, CMV, AV, JC virus, T.gondii and P.jiroveci. SES detected 100% in samples containing low viral

concentrations: 91, 61, 206 and 200 copies/ml for HSV, VZV, AV and JC virus and 2500 IU/ml for CMV, whereas the same specimens were detected in 68.8%, 59.9%, 66.9%, 76.8% and 76.2% by other EQA participants. Even though, low sensitivity was observed in case of HHV-6 and EBV when compared to the other participants with low copy number samples, SES had a higher detection rate for these two viruses in samples with high copy numbers when compared to other participants. Overall the specificity of SES was 100% for all the 9 viruses, 3 fungii and 1 parasite. In case of the resistant markers SES had missed out on those markers that are not part of SES panel. Only in case of VRE SES did not detect two cases of Van B gene. In conclusion, SES is a very a specific and sensitive test allowing rapid (in one work day) and simultaneous detection of multiple viruses from a small volume of sample. This assay can be used across different body fluids (CSF/blood/urine etc., ) depending upon the site of infection (CNS or blood stream).

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## Relevance of urinary NGAL in critical illness

**Presenting Author:** Dr Hina Mohiuddin,
**Co-authors:** *Dr. Kaladhar S, Dr. Srinivas S, Dr. Ganshyam JM, Dr. Pradeep Reddy P*

**Background:** Acute Kidney Injury is not uncommon among critically ill patients. AKI is known to influence the outcomes. Early identification of patients at risk of AKI or of those needing renal replacement therapy could help in optimising the management of AKI. Neutrophil Gelatinase Associated Lipocalin is a potential biomarker which is well validated for identification of AKI in general population. **Aim:** To study the correlation between urinary NGAL values and AKI among a general ICU population. **Methods:** All patients admitted to the ICU of a tertiary care hospital were evaluated over a 2 month period from 1 August 2014 to September 30 2014 were evaluated for inclusion into the study. Patients with established CKD were excluded. APACHE and SOFA scores were recorded at admission and at diagnosis of AKI. Daily fluid balance, acid base status, need for ventilatory support, need for RRT and oxygenation status were recorded on a daily basis. Urinary NGAL was measured using ELISA technique on day 0, 24 hrs and at diagnosis of AKI. The primary end point studied was development of AKI and requirement of RRT. Secondary points of interest were correlation of NGAL with SOFA and APACHE scores. The trends of NGAL in relation to fluid balance was also recorded. Correlation was assessed by Pearson's coefficient using a two tailed analysis. **Results:** A total of 80 patients were enrolled into the study out of total of 141 admissions into the unit during the study period. 24 eligible patients did not consent for the study. The mean APACHE score of the cohort was 14.02. The men renal SOFA score was 0.81. The mean NGAL scores across the cohort was 258.25. The admission NGAL did not correlate well with APACHE but correlated well with the SOFA scores. Patients needing RRT had NGAL values consistently higher than 200. Patients with a positive balance and early rise in NGAL had a higher chance of needing RRT, while those with a negative fluid balance needing RRT had a late rise in NGAL. NGAL values did not differ between and septic and non-septic subsets. Patients who had ongoing AKI had higher persistent NGAL values than those whose renal function recovered in ICU. **Conclusion:** Urinary NGAL as a biomarker of AKI can be reliably used in a general population of critically ill patients. Effect of fluid balance on renal function is also reflected in the urinary NGAL values.

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## Patterns and consequences of intra hospital transport of critically ill patients

**Presenting Author:** Dr Naveena N,
**Co-author:** Dr Srinivas S, Dr Ganshyam JM, Dr Pradeep Reddy P

**Background/Purpose:** Transport of Critically Ill Patients within the hospital is an integral part of delivery of critical care. The effects of spending time outside the ICU needs to be understood to improve the organisation of critical care services. **Methods:** All patients admitted to a tertiary referral ICU for a six month period from 1 May 2014 to 30 October 2014 were included. Demographic data, APACHE score on the day of transport, hemodynamic and ventilation status before and after transport, adverse events during the transport and time of the day when the transport was effected were recorded. Primary outcome of interest were hemodynamic and respiratory effects of the transport. Secondary endpoint was the influence of this transport in changing the plan for the patient **Results:** A total of 637 patients were admitted to ICU during this period. Out of these 43 patients needed transport on 57 occassions. The mean APACHE II score of the patients on the day of transport was 23.84. Twelve of the transports were for a therapeutic purpose. The mean time taken for the 45 diagnostic transports was 51.07 minutes. 22 of these patients were ventilated and 16 were on vasopressor infusions. Majority transports happened between 12noon 4pm. The mean drop in P/F post transport was 57.9 among 14 patients. Six of the transported patients died within 24 hours of transport. Hemodynamics worsened after 6 of the 57 transports. None of these were associated with immediate mortality. 40% of diagnostic transports did not change treatment plan. No vascular access related complications occurred, with one tube migration occurring during the study period. One patient had an arrhythmia needing resuscitation during the transport. **Conclusions:** Transport of critically ill patients can be made safer with proper selection and preparedness for complications

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## Evaluation of the use and indications of high flow nasal therapy in adult critical care

**Authors:** Dr. Atiharsh Mohan Agarwal
**Co-authors: Dr.** I Gonzalez, Dr. H Mainman, Dr. A Bartakke
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**Introduction:** Improving gas exchange and decreasing work of breathing are clinical end-points when managing patients with respiratory compromise. A high flow oxygen (HFO) therapy system can deliver a high flow air/oxygen blend through a nasal cannula or tracheal adapter The main aim of this evaluation was to assess indications for the use of high flow nasal therapy in the adult critical care. Other aims were to produce local guidelines and facilitate the training of staff for its use and evaluate patients and staff satisfaction. **Methods:** We recently introduced the use of high flow nasal therapy in adult critical care (Optiflow™, Fisher & Paykel).After a period of intense training, we completed an observational prospective evaluation every time it was used during 12 weeks. A satisfaction questionnaire was also given to patients and staff. **Results:** A total of 84 cases were included. The indications for the use of high flow nasal therapy were Type 1 and 2 respiratory failure, break from conventional BiPaP and post extubation .The average starting flow was 30 l/min and average FiO2 0.4. From the 84 cases, 72 patients were successfully weaned off apart from 2 that required escalation to invasive ventilation.10 patients needed switching to conventional BiPaP. 26 staff completed a satisfaction questionnaire, 88% quoted that it was easy/very easy to set up, but 3 would have liked more training. One comment was about difficulty to use if there was a nasopharyngeal airway in place. 54 patients completed a questionnaire, one complained that hurt his nose but 53 patients found it more comfortable than face mask and thought that have helped them to get better. **Discussion:** HFO consists of a heated, humidified high flow nasal cannula (HFNC) that can deliver up to 100% heated and humidified oxygen at a maximum flow of 60 LPM via nasal prongs or cannula providing a CPAP effect, invreasing V/Q ratio, decreasing work of breathing and washing out airway dead space.

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## Profile of poisoning in a Tertiary Care Hospital

**Presenting Author:** Dr. Mohamed Kassim,
**Co-author:** Dr. Sahajananda. H RRMCH

**Aims –** The aim of this retrospective study was to analyze the rate and characteristics of acute poisoning cases admitted to adult intensive care unit (ICU) in a tertiary care medical college hospital. We report the demographic, laboratory, and clinical features of cases, mortality rate, and the results of our treatment modalities. **Methods –** The study was done in patients admitted with history of poisoning under the department of medicine at RRMCH Hospital, Bengaluru from December 2012 to February 2013.This study includes 80 poisoning Patients who were admitted to ICU care. Detailed history and clinical examination were done in all patients. Ventilator support was instituted to required patients as per our ICU criteria for intubation and Ventilation. Data was collected in structured format. **Results –** Most of the cases were organophosphorus compound poisoning(n=80, 75%). Others had consumed drugs which included analgesics, carbamates, antihypertensives, benzodiazepines.2 had consumed aluminium phosphide and both of them died. The most common indication for mechanical ventilation was respiratory failure, which mainly includes OP poisoning. **Conclusion –** Pesticides were the major cause of poisoning(75%), the reasons being agriculture based economics, poverty and easy availability of highly toxic pesticides. Patient education by conducting community based camps and lectures might also help in bringing down the incidence. The poisoning related mortality could be decreased by enhanced ICU care and appropriate supportive therapy. There appear to be significant opportunities for reducing mortality by better medical management and further restrictions on the most toxic pesticides.

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## Prognostic indicators in suicidal hanging- A retrospective analysis

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**Introduction:** Hanging is a method of suicide with a devastating impact and, unfortunately it is common in India. Patients who have attempted to hang themselves are usually transferred to the ED. They require admission to intensive care unit for further treatment. Hanging is typically fatal, but sometimes patients recover and leave the hospital without neurologic deficits. The goal of the present study is to review variable factors influencing outcomes in hanging and to identify prognostic factors related to outcomes. **Methods**: All patients, aged above 18 years who presented with suicidal hanging to Emergency department of BGS Global hospital, Bangalore over a period of 2 years from October 2012 to October 2014 were studied. A retrospective analysis was done. All the data regarding demographic, clinical patterns and subsequent outcomes were analyzed using chi- square test and Fisher exact test. Prognostic factors for poor outcome were identified. **Results:** A total of 28 patients presented to BGS Global hospital during the 2 year period of October 2012 to October 2014. Majority of patients presenting were young with the mean age of 28±9 and with a female (68%) preponderance. Time to presentation to ED (> 2 hours) was found to have a significant impact on outcomes. Overall, survivors had better GCS (>8) and Systolic BP (111 ± 23.7) on arrival to ED as compared to non survivors. Acidaemia and hyperlactatemia (p value: < 0.0001) in ABG on arrival were also found to be independent predictors of poor outcome. Overall mortality noticed in our study was 50%. **Discussion:** Hanging injuries are associated with a high overall mortality rate. With the admission GCS and systolic blood pressure being the best predictor of outcome. We also observed that acidaemia and hyperlactatemia were also independent risk factors of poor outcome. Early presentation to ED was associated with better neurological outcome among survivors. Among non survivors, majority of patients presented with cardiac arrest on arrival. Most of the survivors were lost on follow up, so long term neurological outcomes could not be assessed.

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## A study of the profile of patients on mechanical ventilation in medical Intensive Care Unit

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**Background:** Mechanical ventilation has become an important mode of therapy for treating patients who have impaired pulmonary function. Complications can occur due to assisted ventilation. These complications continue to be a major determinant of their outcome. Unless we find the out the exact incidence of complications of assisted ventilation, we will not be able to recognize the magnitude of the problem and implement necessary preventive strategy. This study has been undertaken to find out the incidence of "Ventilator associated pneumonia" (VAP) as it is one of the major complications of assisted ventilation. **Objectives:** 1. To study the incidence of ventilator associated pneumonia (VAP) based on Clinical pulmonary infection score system (CPIS) in medical ICU. 2. To study the indication for mechanical ventilation in these patients 3. To study the causative organism for VAP in our institution 4. To study the effect of conditions like COPD, Diabetes mellitus on incidence of VAP **Methods:** This is prospective study done over a period of one year, includes all cases admitted to medical ICUs requiring mechanical ventilation for more than 48 hours. The study included detailed history, physical examination, indication for mechanical ventilation, white blood cell count, gram stain of tracheal secretions, and clinical pulmonary infection score. **Results:** In our prospective study, the incidence of VAP was found to be 10% with high incidence in age group > 60 years without statistically significant difference between genders. The incidence of early onset VAP is 4.3% and late onset VAP is 30.8%. Most commonly isolated organisms were pseudomonas (33.3%) and candida (33.3%). Klebsiella was the most common organism isolated in patients with MV< 7 days while pseudomonas was commonest in MV >7days. The most common comorbid conditions patients suffering were COPD and diabetes. **Conclusion:** The commonest indications for mechanical ventilation were lower respiratory infection and chronic obstructive pulmonary diseases. Culture reports also showed growth of organisms in patients who had CPIS <6, hence diagnosis of VAP may require other methods of diagnosis and will need the study in large population and longer duration. Although not statistically significant, patients with COPD had incidence of VAP about 18.2%.

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## Optimum utilization of infection prevention practices can reduce emerging drug resistance, an experience at a Tertiary Care Centre in Marathawada

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**Background:** Marathawada is eastern part of Maharashtra state. It consists of 10 districts and relatively economically poor. The re-emergence of MDR gram negative organisms in critically ill patients poses many challenges to clinicians especially on the background of lack of new antibiotics in pipeline and cost of treatment. Our hospital is one of the well recognized tertiary care centres in this region. We

observed a significant change in resistance pattern (especially MDR) of bacteria isolated from ICU in 2011.It was also observed that many of the patients can not afford antibiotics required to fight MDR infection leading to premature withdrawal/ discharge of patient which was painful for the patient & family and treating doctor as well.**Objective:** 1) To carry out a retrospective study on bacterial isolates from various clinical specimens from ICU in our hospital in Marathwada and analyze its susceptibility 2) To assess impact of awareness campaign regarding antibiotic policy and infection control practices, such as hand hygiene, a clean environment and appropriate barriers, on MDR bacterial isolates **Methods:** Study included samples (sputum, ET secretions/ T'stomy secretions, Urine, pus) collected from ICU over 3 years (from August 2011 to August 2014). Total of 1053 samples were collected and tested for bacterial isolates and their sensitivity pattern by standard method at our microbiology lab. In view of rising trend of MDR gram negative organisms in 2011, Hospital Infection control committee decided to implement various infection control practices amongst all staff working in ICUs and OT. **Results**: 1) Common bacteria isolated: Acinetobacter *E. coli* Klebsiella pneumonia Pseudomonas aeruginosa MRSA 2) Introduction of hand hygiene practices resulted in reduction in incidence of MRSA & MDR Pseudomonas aeruginosa by 8-10% each year. 3 in the course, resistance pattern of Acinetobacter changed posing a problem to-date. **Conclusion**: Repeated approaches are needed to reduce colonization of MDR bacteria and their subsequent infection is need of the hour. Adherence to the infection control programme will help in reduction of resistant organism and successful outcome of critically ill.

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## Pseudocholinesterase as a predictor of mortality and morbidity in organophosphorus poisoning

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Abstract: Organophosphorus (OP) pesticide poisoning is a major clinical and public–health problem in India. Mortality rate remains high at 15–30%. Several studies have aimed to determine prognostic factors in organophosphate poisoning. This is a retrospective observational study to examine the relationship between Pseudocholinesterase (PChE) activity and morbidity and mortality in OP poisoning. **Materials and Methods** OP poisoning cases admitted to Columbiaasia Referral Hospital ICU over five years from 2010 to 2014 were studied. Patients less than 16y ears of age, patients on steroids, neuromuscular weakness were excluded from the study. Serum pseudocholinesterase level was estimated at the time of admission and the severity of poisoning assessed according to this level .The dose of atropine given, GCS at admission, onset of infection, need for ventilator support, ICU length of stay and ICU mortality rate were the variables that were compared. **Results** Thirty-seven patients fulfilled the inclusion criteria, of whom 65% were males .They were in the age range of 20 to 57 years. The study population with PChE level <1IU/L was compared with PChE level >1IU/L . Those with PChElevel <1IU/L had lesser ventilation free days (P = 0.001), longer ICU length of stay(P = 0.001) . ICU mortality rate was 25% in patients with PChElevel <1IU/L (Sensitivity 83%, specificity 64%). Demographic data was comparable among the study population. **Conclusion** Pseudocholinesterase level at presentation is a reliable indicator of the severity of OP poisoning and a predictor of the need for mechanical ventilation and the duration of stay in ICU. Further studies with larger population is needed to draw conclusive evidence. **Key words:** OP poisoning, Pseudocholinesterase, Atropine, Glasgow coma scale, Morbidity

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## Incidence and reasons of fluid overload in patients admitted with shock

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**Introduction** Positive fluid balance has been associated with higher morbidity and mortality in several observational studies across different patient population, including septic shock. A large randomized trial of patients with acute lung injury showed that restrictive fluid management strategy resulted in fewer days on mechanical ventilation. Data is scarce on the incidence and the main contributors of fluid overload in Indian ICU setting. This study was done to explore the same. **Methods** We conducted an observational study in a multi disciplinary intensive care unit of a tertiary care hospital from October to December 2014. Patients of either gender with age ≥ 18 years presenting with shock (defined by systolic blood pressure < 90 mm Hg and needing vasopressors for > 1hr) due to any cause were evaluated. Data including patients demographics, daily and cumulative fluid balance, type and volume of fluid used for resuscitation, volume of fluids used for medications, vasopressor days, requirement of renal replacement therapy (RRT), ventilator days, length of ICU and hospital stay were collected. Patients were followed up for 28 days or until hospital discharge or death. Data was analyzed by standard statistical methods. **Results** A total of 35 patients were included in this study (23 Males, 12 Females). The mean age of study population was 63 years and mean APACHE II score was 23.3. Most patients (77.14%, n= 27) had shock due to sepsis, while 2 patients had hypovolemic shock and 6 patients had combination of septic and cardiogenic shock. The mean ICU stay was 10 ± 5 days and the ICU mortality was 22%. The mean volume of fluids received on day 1 was 3.5 ± 1.5 litres. It was noted that 33 patients (94.3%) had positive fluid balance on day 3 with a mean positive cumulative balance of 5.4 ± 3.9 litres. 43% of this positive balance on day 3 was contributed by fluids used for antibiotics, sedation, analgesia, bicarbonate infusions and other IV medications. The predominant fluid used was crystalloids (67%). 0.9% NaCl was the most commonly used crystalloid and isotonic albumin 5% was the most commonly used colloid. 17 patients (51.5%) with septic shock received renal replacement therapy. The mean time spent on ventilator was 7.71 ± 3.9 days and on vasopressors was 3.7 ± 2.8 days. **Conclusion** Fluid overload is common in our ICU setting. Medications and infusions contribute significantly to positive fluid balance in these patients. 0.9% Saline is still the most common fluid used for resuscitation, maintenance, medication admixtures and supplementary infusions.

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## Renal replacement practices in acute kidney injury in a multidisciplinary Tertiary Critical Care Unit

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**Introduction**: Acute kidney injury requiring dialysis is a serious complication in patients admitted to ICU and is associated with increased morbidity, mortality and cost of care. The practice of dialysis with regards to dose, modality and indication is extremely variable and only few studies in Indian scenario have explored dialysis practice patterns and associated outcomes. The study was performed to audit our dialysis practices and outcomes. **Methods:** This is an observational study conducted from October to November, 2014 in a multidisciplinary critical care unit (MDCCU) at Apollo Main Hospitals, Chennai. After excluding patients with CKD (baseline Sr. creatinine ≥2.0mg/dl) all patients requiring renal replacement therapy (RRT) were included in this study. The major indications necessitating the initiation of dialysis, the initial modality of RRT, use of a diuretic challenge before starting RRT, change in vasopressor requirement before and after starting RRT were recorded. The cardiovascular SOFA score was calculated as a measure of hemodynamic stability. Data was analyzed using standard basic statistical methods. **Results:** 35 consecutive patients (M/F = 26/9) who required renal replacement therapy during their ICU stay were included. The mean age of study population was 58±14yrs.The mean APACHE II score was 22.8±13. Sepsis was the

most common etiology of AKI in our study group (80%, n=28). The most common indication for starting RRT was azotemia, (85.7%, n=30) followed by oligoanuria (62.8%, n=22).The mean Blood urea level and Serum.creatinine level before starting RRT was 114.7mg/dl and 2.8mg/dl respectively. Sustained low efficiency dialysis (SLED) was the most common initiating modality of RRT(62.8%, n=22), CRRT was initiated in 12 patients(34.3%) and IHD in 1 patient(2.8%). Diuretic challenge was used in 8 patients(22.8%) before starting RRT. There was no change in cardiovascular sofa score before and after starting RRT. The mortality in our study population was 25.7%. **CONCLUSION:** The most common etiology for AKI in our CCU was Sepsis. Azotemia was the most common indication for starting RRT, followed by oligoanuria, acidosis, fluid overload and electrolyte imbalances in that order .Although azotemia was the most common indication, it was observed that most of these patients also had 2 or more other indications for initiation of RRT. The only patient where azotemia was the sole indication for RRT had exposure to contrast for radioimaging and RRT was initiated to prevent contrast induced nephropathy. SLED was the most common initiating modality of RRT and was well tolerated by all patients. Diuretic challenge was not tried in majority patients because of their labile hemodynamic status.

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## Audit on intrahospital transport of ICU patients in a tertiary care cancer hospital

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**Introduction:** The transport of critically ill patients to procedures or tests outside the ICU is potentially hazardous, hence the transport process must be organized and efficient. Transport may be prehospital, interhospital and intrahospital, enormous data available on pre and interhospital transport of patients, the available data on intrahospital transport is scanty. We have done audit on intrahospital transport of adult critically ill patients in our tertiary care cancer centre over a period of 6 months. **Methods:** 120 critically ill patients transported from the ICU for either diagnostic or therapeutic procedure over a period of 6 months (June to November-2014) were included. The data collected includes, mode of transport (on transport trolley or with the patient's bed itself), where they transported (CT scan, Intervention radiology, MRI scan, Operation theatre and Radiotherapy), the accompanying person(Junior or Senior resident), total time spent outside the ICU and any adverse events and adverse change in vitals in relation to the above said parameters were noted. **Results:** 120 critically ill adult patients underwent intrahospital transport, among which 83(69.16%) pts shifted on transport trolley and 37(30.83%) pts shifted with bed. 32(26.7%) patients were accompanied by 2nd year junior resident, 27(22.5%) by the 3rd year junior resident, 47(39.2%) by 1st year senior resident and 14(11.7%) patients by 2nd year senior resident. 77(64.1%), 4(3.3%), 4(3.3%), 32(26.6%) and 3(2.5%) patients shifted to CT scan, operation theatre, MRI scan, Intervention radiology and to Radiotherapy respectively. Median heart rate, median mean blood pressure and median P/F ratio in trolley group before shifting to destination are 119, 76 and 215 respectively and that of after shifting back to ICU are 126, 75 and 248, which shows no significant difference(P>0.05). In the patients who shifted with the bed Median heart rate, median mean blood pressure and median P/F ratio before shifting to destination are 112, 81 and 375 respectively and that of after shifting back to ICU are 112, 90 and 362, which shows no significant difference(P>0.05). The patients who were shifted on the trolley were sicker than that those who shifted with the bed itself. During the transport 5(4.1%) patients required endotracheal intubation, 5(4.1%) patients required intercostal drain placement in view of pneumothorax. 24(24.1%) patients required new intravenous line placement in view of accidental coming out of iv line, 20(27.5%) patients required cardiopulmonary resuscitation either in terms of need for chest compression or need for bolus dose of Adrenaline. 4(3.3%), 4(3.3%), 2(1.6%), 4(3.3%) patients had significant bradycardia(heart rate <50/min), significant tachycardia(HR >180/min), severe hypotension(mean BP <50mmhg) and severe hypoxia(SPO2 < 60%) respectively, and there is no difference between the mode of transport (trolley vs with bed) in the adverse change in vitals(P>0.05). Central venous catheter came out in 2(3.9%) patients, drain came out in 3(6.6%) patients, ryles tube came out in 1(1.2%)patient. 2(2.7%) patients got self extubated and in one patient tracheostomy tube came out accidentally. The adverse events were more in patients who spent more than 60 minutes outside the ICU particularly requirement of CPCR (2(1.6%) vs 31(25.8%), <60min vs >60min respectively) with P<0.05. The unfavorable changes in vital parameters and untoward adverse events were more in patients whom accompanied by first year senior resident than the patients who were accompanied by other remaining residents. Transport helps in change in therapy in the form of putting a pigtail for the collection, surgical reexploration and angioembolisation etc in about 32(26.7%) patients. **Discussion and conclusion:** Transport should occur when the benefits to the patient exceed the risks, diagnostic test or procedure expected to alter management, it does not compromise the patient's outcome, patients needs services that exceed the available resources of a facility. Our audit shows that intrahospital transport and imaging led to change in therapy, though the transport often led to hazardous changes in vital parameters. No difference in change in vital parameters whether the pts shifted on either trolley or with bed, significant adverse events known to occur during intra-hospital transport, and the adverse events were more in pts who spent more time outside the ICU. The adverse events were more in patients who are accompanied by the first year senior resident, probably because they shifted the more sicker patients and were newer to the institute as they just joined the institute. To summarize do not transport unless absolutely needed, carry out minor interventions at bedside if possible, stabilize patients before transport, prepare adequately with appropriate drugs / equipment / monitoring, have trained personnel accompany the patient, ensure proper documentation and handover.

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## Comparison of illness severity scoring systems for mortality prediction in Neurointensive Care Unit

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**Introduction** Illness severity scoring systems provide information about patients' severity of illness and help to predict patient outcomes in terms of mortality and length of stay (LOS). In this retrospective study, we compared the predictive power of APACHE II & IV, SAPS, $MPM_{24}$ and GCS with the actual outcome of patients admitted to our Neuro ICU over a period of 6 months. **Materials and methods:** Data required for calculation of the above scores was obtained from medical records including demographics, type of admission, presence of chronic illness or immunosuppression, the lowest and the highest values of GCS and vital parameters, biochemical and haematological investigations, intensity of treatment received in ICU, infection or shock in first 24 hours and hours of mechanical ventilation. The outcome at discharge was recorded as Glasgow Outcome Scale (GOS). Online calculator was used for calculating the scores. **Results** Out of the 224 patients admitted, the data was complete in 184 patients. Imputation technique was used to complete the missing data. Disease categories were intracranial lesions, head injury, neuromuscular, spine pathology and stroke. The mean values (SD) for GCS, APACHE II, APACHE II PMR, APACHE IV and PMR, MPM PMR, SAPS and PMR and GOS were 11.06 (3.47), 15.14 (6.75), 24.95 (17.50), 30.41(13.3), 5.86 (7.06), 12.89 (19.67), 24.69 (13.97), 11.96 (17.03) and 3.34 (1.48) respectively. Overall, 71.4% of patients had favourable outcome (GOS 3, 4 and 5). Mortality rate predicted by the scoring systems correlated negatively with GOS, while GCS had significant positive correlation with GOS ($p < 0.001$). Non-survivors {GOS of 1(n=43)} and patients with unfavourable outcome (n=64, GOS 1-2) had significantly higher

scores compared to survivors {GOS of 2-5 (n=181)}, and those with favourable outcome (n=160) respectively. The AUCs were 0.249, 0.765, 0.767, 0.676, 0.762, 0.764, 0.736 and 0.793 for GCS, APACHE II, APACHE II PMR, APACHE IV score, APACHE IV PMR, MPM PMR, SAPS score and SAPS PMR respectively. Hence, the overall predictability was 84.4, 83, 82.1, 81.7, 83, 82.6, 84.4 and 84.8 % by GCS, APACHE II, APACHE II PMR, APACHE IV, APACHE IV PMR, MPM, SAPS and SAPS PMR respectively. **Discussion** Higher values of APACHE II, IV, MPM and SAPS and lower values of GCS were associated with worse outcome. The overall predictive value was highest for SAPS and GCS (84.8 and 84.4 respectively) and lowest for APACHE IV (81.7%). We also found that GCS fared equally well when compared with other scores, inspite of diverse neurological study population. SAPS II has the highest discriminative ability amongst all the scores. Limitations of our study include its retrospective nature requiring imputation for missing data which might reduce the accuracy. Second, this being a single centre study, the applicability of results to a larger population needs to be tested. Although all the scores analysed in this study had good discrimination and good predictive power when used in neurological patients, SAPS II faired slightly better. Hence, SAPS may be a better option in patients with neurological diagnosis but GCS is simple and practical score and does not require enormous effort for data collection. Hence, the use of GCS can be continued in view of its simplicity.

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## Blood transfusion practices in Critical Care Unit

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**Introduction:** Transfusion of blood products is common in critical care practice. There has been consistent data suggesting supremacy of a conservative transfusion strategy. The transfusion practices in the Indian setting and the compliance with the current evidence based recommendations are largely unknown. We hence sought to audit our blood product transfusion practices and evaluated incidence of transfusion related adverse events. **Methods:** Single centre prospective observational study conducted in a tertiary care hospital Critical Care Unit (CCU) from 1st November 2014 to 20th December 2014. All patients admitted in CCU with age >18 yrs of either gender were included in this study. The type of blood product, indication for transfusion, age and volume of the product were noted. The indications for transfusion were categorized into appropriate and inappropriate based on current evidence based guidelines. Any complication during transfusion and within first 24 hours post transfusion was recorded. **Results:** 121 patients were admitted during this study period of whom 45 (M/F = 31/14, Mean age: 57.5) received transfusion. The mean APACHE II score of the study population was 24.16 patients received only Packed Red Blood Cells (PRBC) (average 1.6 units), 4 received only Fresh Frozen Plasma (FFP) (average 2.5 units), 4 received only platelets (average 2.5 units) and 21 patients received combination of products during their CCU stay. The most common indication for PRBC transfusion was Hb < 7, for FFP was active bleeding with INR>1.5 and for platelets was platelet count < 1, 00, 000 with active bleeding. The average age of the transfused PRBC was 22.7 days. One patient had febrile transfusion reaction during PRBC transfusion. Ninety five percent of transfusions were appropriate, based on evidence and 5% of transfusions were for indications not listed in evidence based guidelines. **Discussion:** Approximately 1/3rd of patients (37.1%) admitted to CCU are receiving blood products. Most patients (46.6%) received combination of products and PRBC was the predominant product given alone. Over 95% of patients received blood products only for evidence based indications. Our complications rates were low which may be due to the use of leucocytes depleted PRBCs.

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## A new concept in severe ARDS: Non-Invasive ventilation (NIV) in the prone position as a strategy to prevent invasive ventilation

**Presenting author:** Dr. Muralidhar T R

**AIM:** NIV isused for certain subsets of ARDS, with variable success. On the other hand, prone mechanical ventilation (MV) is a recommended rescue strategy for severe ARDS. We did this study to examine the impact of a new combined strategy - NIV in the prone position (Prone NIV or P-NIV), in a subset of patients with severe ARDS. The rationale was that lung recruitment in these patients would be better than supine NIV with PEEP, and P-NIV can be one more strategy in ARDS before invasive MV. **Material and Methods:** Retrospective non-randomised case series in an ICU over 2 yrs

**Inclusion Criteria:**
ARDS defined according to American – European consensus criteria
Severe ARDS defined as $PaO_2/FiO_2$ ratio < 100 mmHg, with $FiO_2 \geq 0.6$.
A. NIV initiated in the supine position, and the following criteria were used to initiate and maintain P-NIV
Persisting high FiO2 requirement
RR > 40/min
Treating physicians judgement of clinical worsening with imminent MV

**Ventilator details:**
A. Philips V60 in the AVAPS (Average Volume-assured pressure support) mode and the Puritan Bennet 840 in the bilevel positive airway pressure (BPAP-ST) mode
B. Transition from P-NIV to supine-NIV/Supplemental O2
Clinical and PaO2/FiO2 ratio improvement, with the treating physicians assessment of overall improvement: P-NIV was discontinued, with conversion to supine NIV or supplemental O2.
C. Patients who did not improve despite P-NIV for 6-8 hours were initiated on MV with standard ARDS protocols

**Exclusion criteria:**

Coma, seizures or neurological disturbances
Hemodynamic instability
More than 2 accompanying organ failures
Immediate MV needed as per treating physician
Patient non-compliance

**Results:**

16 patients met the criteria.
14/16 (87.5%) patients improved and were transitioned to supine NIV/Supplemental O2.
2/16 (12.5%) patients needed invasive MV
P-NIV improved oxygenation by 30-40% over 2 days.

**Other details:**

Initial $PaO_2/FiO_2$ ratio: 35-55
Time of NIV initiation to P-NIV: 2- 28 hrs (mean 15)
Duration of P-NIV/day: 10- 21 hrs (mean 15.5)
Duration of P-NIV: 22-79 hrs (mean 50.5)
Total duration of NIV (prone + supine): 33-134 hrs (mean 83.5)
Duration of ICU stay: 3-10 days (mean 6.5)
Duration of hospital stay: 7-10 days (mean 8.5)
**Average settings of NIV:**

| | |
|---|---|
| IPAP $cmH_2O$ | 8-25 |
| EPAP $cmH_2O$ | 6-10 |
| Expired TV ml | 380±60 |
| RR breaths/min | 18±6 |
| $FiO_2$ | 0.79±0.16 |

**Complications:** None noted. Well tolerated after intensive counselling **Conclusion & Clinical Implications:** NIV in the prone position in a subset of severe ARDS: 1. Improves respiratory parameters 2. Can prevent MV. 3. Mechanism: P-NIV likely adds to the recruitment in ARDS, above and beyond supine NIV, similar to prone position in invasive MV. 4. This useful modality is to be kept in mind in severe ARDS where NIV is an option. When there is an indequate reponse to supine NIV, P-NIV can be considered in a subset of patients, before invasive MV 5. This has significant implications for reduced ICU and hospital stay, patient comfort, and economic advantages. 6. To conclude, this study shows that P-NIV improves oxygenation in a subset of patients with ARDS and can prevent invasive MV. This concept needs to be further validated in a larger prospective randomized study.

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## Complications of tracheal intubation in critically ill pediatric cancer patients

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**Introduction** Due to various anatomical and physiological considerations, intubation in pediatric patients is known to be difficult and hence they comprise of population at risk of complications which is compounded by critical illness and underlying diseases. Hence, it is important to identify and quantify the frequencies of complications. **Methods** We did a retrospective analysis of prospectively collected data of 42 intubation encounters during November 2013 to December 2014 in patients of age equal to or less than 12 years in a 14-bed oncological critical care unit. Intubations done during cardiopulmonary resuscitation, awake fibreoptic intubation or done immediately after unplanned extubation and mediastinal mass with Computed tomography scan documented tracheal compression or deviation were excluded. Tracheal intubations were performed by residents and fellows, supervised or unsupervised by consultant physicians. All intubations were orotracheal with two operators at head end of which at least one was post M.D. fellow critical care. We recorded complications during laryngoscopy and intubation, successful first attempt intubation rate, use of alternative maneuver. Difficult intubation, defined as needing more than two attempts at laryngoscopy. Hypoxia, defined as fall of SpO2 below 80%. Severe cardiovascular collapse, defined as hemodynamic instability needing vasopressors or any increase in dose of vasopressors. **Results** Complications were reported in 31% (n=13) of intubations. Hypoxia was found in 16.7% (n=7) intubations and severe cardiovascular collapse was noticed in 16.7% (n=7), 9.5% (n=4) had cardiac arrest during intubation. Other complications like esophageal intubation, dangerous agitation, oral trauma and aspiration of gastric content were less frequent each occurred with frequency of 2.4% (n=1). Some intubation encounters had more than 1 complication. Thirty three (76.74%) intubations were successful in first attempt with or without using alternative maneuvers of which alternative maneuvers were used in 7 (16.3 %) patients. Difficult intubation was found in 4 (9.3%) patients. **Discussion** Most common complications during intubation were hypoxia and severe cardiovascular collapse, both were found in equal frequencies. Limitation of the study is that it's a single centre study.

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## Clinical profile of patients requiring prolonged mechanical ventilation and their outcome in a tertiary care medical ICU of India

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**Introduction** An increasing number of patients require mechanical ventilation, for various reasons, and there has been a proportional increase in patients needing prolonged mechanical ventilation. It accounts for about 10% of all mechanically ventilated patients. Although these patients represent a smaller proportion of intensive care unit (ICU) patients, they consume substantial ICU resources. We studied etiology, metabolic and clinical profile, complications and outcome of these patients. **Methods**: This was a Prospective observational Study in the ICU of a Tertiary Hospital over 18 months. All patients above 12 years of age requiring prolonged invasive mechanical ventilation were recruited. Detailed clinical and laboratory records were noted. Sequential Organ Failure Assessment (SOFA) score was calculated on admission. **Results**: Of a total 1150 patients who were admitted in ICU during study duration, 34.5% (n= 397) needed mechanical ventilation and 3.91% (n=45) required prolonged mechanical ventilation. Most common patient subset were: acute inflammatory demyelinating polyneuropathy 28.50% (n= 13), cerebrovascular accidents: 17.30% (n=8) Tetanus 8.60% (n=4) and ARDS 6.50% (n=3 ). The mean age of patients was 32 years. A majority of our patients were aged less than 40 years. Electrolyte imbalances were frequently observed. Ventilator associated pneumonia was the most frequent complication, followed by decubitus ulcers and deep vein thrombosis. There was a statistically significant difference in the SOFA Score of patients who survived (Mean SOFA Score: 2.15) and patients who expired (Mean SOFA Score: 2.89) **Discussion**: The incidence of prolonged mechanical ventilation in our study was 11.3% of total patients requiring invasive mechanical ventilation. There was an increase in mortality with increasing age. There was no correlation between gender and outcome. Ventilator associated pneumonia was the most common complication. High incidence of electrolyte imbalance was noted in patients requiring prolonged mechanical ventilation. SOFA score at admission correlated with mortality.

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## Analysis of mortality and end of life care in tiertiery care hospital

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Care of critically ill patients involve not only application of complex and expensive life supporting interventions but also when appropriate there withholding or withdrawal. Theme of 2014 ISCCM day was 'better understanding of end of life care' and as per pledge taken we are trying to practice it to the best of our ability. Our study analyses the mortality and end of life care in tertiary care hospital. **Aims AND objectives:** Analysis of mortality and end of life care. Analysis of awareness about end of life care. **Method:** Retrospective study was done from january-2014 to November-2014 under the following headings- -Total number of deaths in the hospital and these are divided as deaths in ICU and deaths in wards. - Total number of end of life care consent signed by relatives. **Discussion:** The total number of deaths in the hospital(ICU and wards) during above mentioned period were calculated. After counseling by primary consultant and ICU team, total number of end of life care consent given by relatives in the ICU and in wards were analysed.Number of End of life care patients in the ICU admitted from wards after calling code blue were studied. Also the reason for end of life care were analyzed. **Results:** -Majority of deaths (>75% of total deaths)were in the ICU. -Even after extensive counselling only 50% relatives were ready to sign the end of life care consent. ->90% of ward deaths were under end of life care, but >15% of relatives called code blue even after giving consent.

-Majority of end of life care patients were >60 yrs of age and died because of terminal illnesses like shocks with multiorgan failure, end stage malignancies, alcoholic cirrhosis with hepatic encephalopathy, cerebrovascular accidents and intracranial bleeds. **Conclusion:** Only 50% deaths in the hospital were with an end of life care consent. In spite of counselling for end of life care in wards >15% called code blue and patients were shifted to ICU and died there, hence more grief counselling required from primary consultant and social workers with more awareness about end of life care amongst care givers.

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## Clinical spectrum, outcome & challenges in refractory hypoxemic patients

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**Introduction**: Refractory hypoxemia continues to be a challenge for intensivist. Irrespective of etiology, it is associated with high morbidity and mortality. Newer modalities have been tried to manage these patients. Early aggressive management of precipitating illness together with protective technique of mechanical ventilation and conservative fluid management reduces mortality in refractory hypoxemia**.** **Methods**: This prospective observational study was carried out in a tertiary care hospital in New Delhi. Adult Patients admitted in Intensive Care Unit from 2009-13 with a severe hypoxemia ($PaO_2/fiO_2$ less than 100) unresponsive to conventional ventilatory strategies were included. **Results**: A total of 1755 patients were admitted to the Intensive Care Unit in the study period with respiratory causes accounting for 20.5% of total ICU admissions. More than 20% (388/1755) suffered from severe hypoxemia. Around 40 % of these patients (155/388) were labelled as refractory hypoxemia. The most common cause of refractory hypoxemia was viral pneumonia (36.3%), followed by bacterial pneumonia (26%). Other causes included acute liver failure, trauma, dengue, malaria, aspiration pneumonia, etc. The mortality in these patients with refractory hypoxemia was high (54.8%). **Discussion**: Hypoxemia is the major determinant in most of our ICU admissions and for initiation of mechanical ventilaton. Pneumonia (viral or bacterial) is the major etiology leading to refractory hypoxemia. Management of refractory hypoxemia require use of alternative ventilator strategies, alternative oxygenation strategies and extracorporeal strategies like ECMO and $ECCO_2R$ which will be discussed. Mortality associated with refractory hypoxemia continues to be very high

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## Retrospective analysis of complicated cases of Dengue haemorrahagic fever admitted in a tertiary care ICU from July 2014 to Dec 2014.

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**Introduction**:- Dengue still remains major cause of ICU admission in Rainy season and it is also associated with Mortality. as very less literature is available on dengue this study carried out. **Aim:**-To study complicated cases of dengue admitted in our ICU from July 2014 to Dec 2014. **Methods**: Retrospective Analysis of Dengue cases with complication admitted in our ICU from July 2014 to 15 Dec 2014 was done. **Inclusion Criteria:** 1)Age >18 years 2)Diagnosis of Dengue infection by NS1 Antigen positive or IgM antibody positive **Result** Total ICU admission due to Dengue was 41. 23 (56%) patients presented with thrombocytopenia of which 9(21%) had bleeding like malena, haematuria. Bleeding was not life threatening and was treated with platelet transfusion .6 (14%) patients presented with MODS of which 3 died. 2 patients died within 24 hours of admission, 1 patient died due to myocarditis. **Discussion** Thrombocytopenia is most common complication of dengue fever. In some patients it was associated with bleeding that was distressing but not life threatening. It was managed with platelet transfusion . Of the non haematological complications- MOD syndrome (comprising of renal, hepatic, circulatory shock, ARDS) was the main cause of mortality in ICU due to dengue fever. Most of the patients presented with bradycardia or a normal heart. The Patients presenting with tachycardia (heart rate > 100 bpm in absence of fever) at admission, all developed MOD hence tachycardia was an ominous sign and indication for ICU admission and aggressive management with fluid resuscitation. During this epidemic we saw three patients admitted to the CCU with ACS who had fever and thrombocytopenia diagnosed to have Dengue .Possibly the underlying CAD manifested due to dehydration and tachycardia.

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## A study of correlation of lung ultrasound B line score and lung compliance in mechanically ventilated patients in the ICU of a tertiary care centre

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**Introduction** A clinically significant increase in lung water is a frequent condition in ICU in mechanically ventilated patients and is usually secondary to acute heart failure, acute lung injury and acute respiratory distress syndrome (ARDS). A quantitative measurement of extravascular lung water would be extremely useful for the clinical management of these conditions, both as index of severity and to guide treatment. B lines (comet tail images) are defined as discrete vertical hyperechoic reverberation artifacts that arise from the pleural line, extend to the bottom of image without fading and move synchronously with pleural movement. They seem to originate from the altered interface between alveolar air and thickened interlobular septa. Extravascular lung water can be diagnosed either by chest x-ray or by ultrasound visualization of "comet-tailed" images. Chest x-rays provide a rough estimation of the extravascular lung water but in the ICU, chest radiographs are hampered by variable exposure and difficult positioning leading to decreased reproducibility. Lung ultrasound is a more reliable method of assessing B line score. **Aim** To study the correlation of lung ultrasound B Line score and lung compliance in mechanically ventilated patients in the ICU of a tertiary care centre. **Methods Study Design:** Prospective Observational study **Study Setting:** Study carried out in a large teaching hospital in Pune. **Study Period:** Study carried out from Dec 2013 to Nov 2014

**Study Population:**

Patients included in study: 40 patients admitted to the ICU receiving mechanical ventilation for more than 48 hours enrolled in the study.
Patients excluded from study:
ASA IV and V patients.
Patients with Ventilator Associated Pneumonia (VAP)
Patients in sepsis
Duration of mechanical ventilation less than 48 hours.

40 patients admitted to the ICU receiving mechanical ventilation for more than 48 hours were enrolled in the study. Static compliance as read by the ventilator was recorded and simultaneously, the patient's Ultrasound lung comets (ULC) score was obtained by performing

a bedside transthoracic ultrasound of the lung with portable USG machine using 4-16 MHz high frequency linear probe. The number of comets from each of the scanning spaces in the anterior right and left hemithoraces, from the second to fifth intercostal spaces were added. The lung ultrasound scan was repeated after 24 hours and lung comet score and static compliance were noted. **Results** Following the completion of the study, Pearson one-way correlation coefficient was derived between B Line score and static lung compliance which showed significant negative correlation (n = 40, r = - 0.80, p<0.01) **Discussion** Increase in B Line score is associated with decrease in static lung compliance. Lung Ultrasound B Line score provides quantitative assessment of extravascular lung water and helpful in predicting severity of disease and lung compliance in mechanically ventilated patients. **Limitations** Single centre study Small sample size Investigator is not blinded to result of study

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## Ventilator associated pneumonia: Our experience in ICU

**Presenting Author:** Surabhi Ashok Lande

**Introduction:** VAP is one of the most commonly encountered hospital acquired infection in ICUs around India, complicating course of management in 7.5-41% of patients who have been intubated and mechanically ventilated for more than 4 days. Though it is associated with significant morbidity and high costs of care, it is a major preventive entity in caring for patients admitted in the intensive care units. **Aims and Objectives:** To study the effects of VAP preventive strategies in our clinical setting that have resulted in clinically relevant outcomes. **Methods:** The incidence of VAP was calculated as a quality indicator in the ICU from Jan 2010 onwards. Various measures were undertaken at different points in time and their impact on the rates of VAP was studied.

1. Effect of Educational Campaigns, Hand Hygiene Campaigns in May and Infection Prevention Weeks in October. The most impressive effect was seen in the second half of 2010 when the rate fell from 33.71 in September to 15.23 and 11.90 in the following 2 months.
2. Implementation of the VAP Bundle in March 2011, comprising of Head end elevation, sterile placement of ET/TT, daily review of sedation, daily assessment of weaning and extubation, daily chlorhexidene mouth wash, DVT Prophylaxis and strict Hand Hygiene Compliance
3. As we had an increased incidence of Acinetobacter isolates, few measures were taken to tackle this, which might have contributed in decreasing VAP Rate.

a. Measures #1 (July 2011)
i. Replacement of Alcohol Hand Rubs with Chlorhexidene-Alcohol Hand Rubs
ii. The hospital was using Cloth Folders for patient files. We thought that this could be a source of Infection of Acinetobacter, and these were replaced with Plastic folders
iii. Replacement of cushioned chairs in the ICU with plastic chairs
iv. Introduction of the Cathy Kit. (July 2011).
b. After seeing a spurt, in May 2012, a few more measures were taken over the next few months (Measures #2)
i. 1:1 Nurse Patient Ratio for ventilated patients
ii. Ambu Bags individually packed after ETO
iii. Using ID50 (Quats) for Laryngoscope Blades disinfection
iv. Using Alprojet to clean the suction jars and tubing
v. Preventing condensate in the ventilator tubings from going into the patient's side. Culture of one of these condensates had yielded MDR Acinetobacter.
vi. 2013, 2014 surprise audits on hand washing and VAP bundles compliance were conducted by the ICN and analysed.

**Results:** The VAP Rate dropped from a high rate of 23.4 / 1000 Ventilator days (average in 2010) to of 6.25 / 1000 ventilator days (average in 2011) and 3.25 / 1000 ventilator days (average in 2012) over 3 years. In 2013 and 2014 the average rates were 3.82/ 1000 Ventilator days and 2.77/ 1000 Ventilator days respectively **Conclusion:** Persistence of efforts on all fronts is required to contain the rates of Ventilator Associated Pneumonia by using measures like bundles and good Hand Hygiene Compliance.

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## A prospective study to evaluate and compare the mortality prediction of apache II, apache IV and saps II scoring with the actual outcome in a tertiary care hospital ICU

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ABSTRACT **Introduction:** Clinicians and researchers have long recognized how important ICU performance is to overall hospital mortality. This work has focused primarily on evaluating the scoring systems made for western population, to find out how effective they are in predicting mortality in Indian population, thereby affecting ICU performance and patient care. In this study, we will be focusing on the generic scores, i.e. Acute Physiology and Chronic Health Evaluation (APACHE II and IV) and Simplified Acute Physiology Score (SAPSII). **Method and Material:** A prospective observational study of 100 ICU admissions was done. For each patient, demographic data, diagnosis, length of ICU stay, APACHE II score, APACHE IV score, SAPS II score and ICU outcome was obtained from the first 24 hours of ICU admission till the last day of their stay in ICU and the actual outcome was compared with the predicted outcome by various ICU scorings. **Result and Conclusion:** The current study revealed the usefulness of SAPS II for mortality assessment. All the scales showed acceptable discriminating abilty (SAPS II had maximum). In the current study all the three scores were found to have good calibration. SAPS-II had maximum sensitivity (88.1%) while APACHE-IV had maximum specificity (70.7%). Maximum accuracy was also observed for SAPS-II. Percentage burden of carrying out extra monitoring for false positive cases out of total test positive results was maximum for APACHE II (42.3%) whereas it was 36.2% for SAPS II and APACHE IV. Thus SAPS II provided best sensitivity at minimum burden.

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## A cross sectional epidemiological study of colistin only sensitive infection in intubated and mechanically ventilated patients over 2 years

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**BACKGROUND:** Colistin only sensitive infections are becoming more common in ICU. Antibiotic resistance is increasing especially among gram negative bacteria and posing a serious threat to public health. Among the many gram negative bacteria species, Acinetobacter baumannii, Klebsiella pneumoniae, Pseudomonas aeruginosaand Enterobacter species are increasingly difficult to treat due to wide variety of resistance mechanisms. **METHODS:** This was a cross sectional epidemiological study conducted over a period of 2 years in the intensive care unit of Columbia Asia Tertiary Referral Hospital. The data was collected from an electronic database over 2 years from November 2012 to November 2014. All patients who were intubated and mechanically ventilated for more than 48 hours were included in the study. Patients below 17 years were excluded. Patients were divided into 4 groups which included neurosurgery, neurology, respiratory, and sepsis to see whether there if any group had high risk of developing colistin only sensitive infections. Variables analysed were percentage of colistin only sensitive infections in intubated and mechanically

ventilated patients, whether any particular group (neurosurgery, neurology, sepsis, and respiratory) had high risk, common colistin only sensitive organism isolated, and culture from which it was isolated, ventilator free days, ICU length of stay, and mortality. **Results:** A total of 301 patients fulfilled the criteria of which 41 (13.6%) had colistin only sensitiveinfection. Of the total 41 patients, 28 (68%) were male. In the subgroup patients who had colistin only sensitiveinfections: Neurosurgery patients, 13 (23.2%) out of 56;respiratory 10 (21.2%) out of 47; neurology 11 (11.2%) out of 98; and sepsis 10 (10%) out of 100. Out of the 41 patients who had colistin only sensitive infection, 25 (60.9%) had Acinetobacter baumannii complex; 10 (24.3%) had Klebsiella pneumoniae; 4 (9.7%) had Pseudomonas aeruginosa, and 1 (2.4%) had Escherchia Coli. Endotracheal and tracheal culture were positive for colistin only sensitive organism in 29 (70.7%) patients, followed by urine culture 7 (17.0%), pus culture 3 (7.3) and blood culture2 (4.8%). Average ventilator free days were 4.98 and average length of ICU stay was 12.65 days. Mortality was noted in 12 (29.2%) out of 41 patients of which 6 (50%) death were noted in the sepsis group. **CONCLUSION:** In this study, we observe that colistin only sensitive infections were more common in neurosurgery followed by respiratory patients. Colistin only sensitive organisms were isolated more in endotracheal and tracheal culture, followed by urine, pus and blood culture. Acentiobacter baumanii complex was isolated in more than 60% of patients followed by Klebsiella penumoniae. Mortality was noted to be very high in sepsis group who had colistin only sensitive infection. Equal number of patients in all four groups is needed to make definitive conclusions.

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## Prevalance of severe sepsis and septic shock and surveillance of antibiotic indications in a multidisciplinary Intensive Care Unit (ICU)

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**Introduction:** Severe Sepsis and Septic shock are undesirable consequences of infection and contribute to a significant number of admissions to the ICU. High usage of broad spectrum antibiotics is associated with increasing nosocomial infections and emergence of multidrug resistant bacteria. The purpose of the present study is to determine the prevalence of severe sepsis and septic shock in the first 24hours of admission to ICU among adults. Also we analysed the indication & duration of antibiotic usage in ICU patents. **Methods:** The study included two types of data collection: Point Prevalence of Severe sepsis & septic shock on the day of admission to ICU Surveillance of antibiotic indications in ICU. This study was conducted on the world sepsis day 2014 i.e., on 13th September 2014 in Apollo Hospitals, Jubilee Hills, Hyderabad. Total number of participating ICU beds were 73 including medical, surgical & neurointensive care units. Study period was started on 13th September 2014 at 10am & concluded on 14th September 2014 at 10am. Antibiotic surveillance was done to analyse the indications for antibiotic initiation. These included 3 groups: Prophylactic antibiotic group Culture positive infection goup (CPIP) Culture negative infection group (CNIP) A detailed questionnaire was prepared and distributed in all ICU's of the hospital. Data was collected from all admitted cases in the first 24hours of their ICU stay irrespective of their current status. All newly admitted cases during the study period were also included with data collection done in the last hour of study period. Criteria for grouping patients into severe sepsis and septic shock were based on the guidelines from Surviving Sepsis campaign 2012. In this study, patients were divided into subgroups of the initial larger group rather than a separate entity. Therefore, septic shock patients form a subgroup of severe sepsis patients. **Results** Total number of ICU beds in our hospital was 73 out of which 62 beds were occupied. (Occupancy rate 84.93%) Total number of medical ICU beds were 42, surgical 11 & neuro ICU beds 20 (32, 11 & 19 occupied respectively) **Estimation of Prevalence of Severe Sepsis and Septic Shock** In total 62 questionnaires were returned from all ICU's. 4 patients were not started on any antibiotics. ( Antibiotic usage -93.54%). Number of patients who met sepsis criteria was 37, 30 patients met severe sepsis criteria and 12 patients had septic shock. This accounts for a prevalence of 59.67 % of sepsis patients, 48.38 % of severe sepsis and 19.35% of septic shock patients among all ICU admissions. Among severe sepsis subgroup, the most common organ dysfunction was respiratory system (70%) & the most common source of infection (suspected or confirmed) was lungs (56.67%) **Antibiotic Surveillance** Among 58 patients evaluated who were on antibiotics, 21 patients were started on prophylactic antibiotics (36.2%) in the first 24 hours of ICU admission. Culture positive infection group (CPIG) constituted 20 patients (34.45%) and culture negative infection group (CNIG) comprised of 17 patients (29.3%) **DISCUSSION** This study was done to know the prevalence of severe sepsis & septic shock as a cause of ICU admission. Also the demographics and clinical characteristics of sepsis patients were identified in ICU. Nearly 60% of all admissions into ICU were due to sepsis in our hospital. The period of interest for us was the first 24 hours of admission which might be outside the study period but it was assumed that the reason the patients were in ICU currently was due to the initial insult. We also restricted our study selectively aiming the determination of the prevalence of community acquired and hospital acquired severe sepsis. The high usage of prophylactic antibiotics and for longer duration was observed. Although we did not estimate the total number of antibiotic days. The culture negative infection group constituted a significant population of patients who were started on empiric therapy. The hospital antibiogram was not strictly adhered to in both these groups. The high prevalence of nosocomial infections in critically ill ICU patients is associated with high antibiotic consumption. Besides the high cost of ICU care, there is constant threat of selection and induction of antibiotic resistance. Selection of appropriate empiric antibiotics and prompt deesclation especially in the culture negative infection group is the need of the hour.

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## Clinical profile of patients of scrub typhus requiring ICU admission in a Tertiary Care Hospital in Sikkim

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**Introduction:** Scrub typhus, a zoonotic rickettsial infection, is one of the differential diagnosis of acute febrile illness, especially associated with renal failure and/or respiratory failure causing increase in both morbidity and mortality. Sikkim in north east region of India has been witnessing increased incidence of such patients requiring ICU admissions, therefore present study was undertaken to study the clinical profile and to establish the predictors of mortality of severe scrub typhus infection. **Materials and Methods:** A retrospective study of patients admitted with scrub typhus infection to a tertiary care hospital in Sikkim, India during a 24 month period. **Results:** The cohort (n=52) aged 37.2 ± 13.8 years (mean ± SD) presented with 10.1 ± 2.3 days after onset of symptoms. Common symptoms included fever (100%), breathlessness (88.4%), decreased urine output (46.2%), jaundice (53.84%) and altered consciousness (26.92%). Thirty-six (69.23%) patients had an eschar which is pathognomic of the disease. The APACHE-II score at presentation in ICU was 21.4 ± 8.51. Forty-seven (80.8%) patients had multi organ dysfunction. Respiratory (96.2%) and renal dysfunction (78.8%) were most frequent. Mechanical ventilation was required in 41 (78.8%) patients, of whom 11 (21.2%) required only non-invasive ventilation. Twelve patients (23.1%) required renal replacement therapy. Actual hospital mortality (26.9%) which was lesser than predicted APACHE-II mortality (41.3%; 95% Confidence interval 34.9-47.7). **Discussion:** This cohort reveals the clinical manifestations and complications of sever scrub typhus infection in the state of Sikkim and highlights the clustering of cases during the months of August to November. The survival of the patients were better when compared to the high severity of illness scores in

patients of severe scrub typhus. This is probably indicative of rapid reversal of multi organ dysfunction with specific antibiotic therapy.
**Keywords:** Intensive care, organ dysfunction, rickettsia, ventilation

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## Vitamin B12 deficiency and associated hyperhomocysteinemia in patients with ischaemic stroke in tertiary care ICU unit in India

**Presenting author:** Dr Krishna Kumar.T

**Abstract: Background:** Hyperhomocysteinemia is a recognized risk factor for ischaemic heart disease (HID), stroke and atherosclerosis . Vit B12, Folate and pyridoxine deficiency are important dietary causes of raised serum homocysteine and vegetarian diet is poor in Vitamin B12. **Aim:** To measure the levels of Vitamin B 12 and associated homocysteine levels in ischaemic stroke patients admitted to ICU unit at Columbia Asia referral hospital, bangalore, India and to find any association between ischaemic stroke and levels of Vitamin B12 with associated hyperhomocysteinemia in these cases. **Method:** Cross sectional study of prospective nature and sample selection is by specification criteria proposed. Consecutive cases of ischaemic stroke either arterial or venous were enrolled over a period of 10 months . Patients on vitamin supplements, bowel resection surgery, renal disease and embolic strokes were excluded . Persons enrolled in study data on dietary habits, medical history including were obtained. Circulating concentrations of vitamin B12, total homocysteine (Hcy), and other risk factors for stroke were worked up . As per international norm normal vitamin B12 levels are between 180-914 pg/ml and value less than 180 were considered deficient and for homocysteine normal values were 5.46- 16 umol/L and value > 16 was considered elevated. Variables are expressed as percentage of stroke cases. **Results:** There were 41 cases of ischaemic stroke in a period of 10 months:39 arterial and 2 venous infarcts. In the arterial strokes 24 of 39cases (61.53%) had low vitamin B12 levels and 18 of 39 cases (46.15% ) had raised serum Homocysteine levels. In arterial stroke cases before 45 years 4 of 5 cases ( 80 % ) had low vitamin B12 levels with associated hyperhomocysteinemia . In the venous strokes cases 2 of 2 cases ( 100 % ) had low vitamin B12 levels with raised homocysteine (Hcy) including venous strokes below 45 years 1 of 1 case ( 100 % ) . In the arterial stroke cases with low vitamin B12 levels with associated hyperhomocysteinemia 7 of 24 cases( 29.16% ) had significant plaque stenosis in one of the major carotid or vertebral vessels and 14 of 24 cases ( 58.33%) had other associated risk factors for stroke, in venous stroke cases none of the patients had any associated risk factors . Out of the total 41 cases 16 patients were on vegetarian diet of which 12 cases (75%) had low vitamin B12 with hyperhomocysteinemia and remaining 25 were non vegetarians (NV) of which 14 of 25 (56 %) had low vitamin B12 levels with hyperhomocysteinemia. **Discussion:** Low vitamin B12 levels resulting in raised serum homocysteine is common in Indian stroke population and could be a major risk factor, this can be a preventable risk factor like other risk factors for stroke such as hypertension, diabetes mellitus, dyslipidemia and atherosclerosis and should be included in regular work up for ischaemic stroke persons more so in persons less than 45 years . Important predisposing factor for low vit B12 and homocysteinemia being vegetarian diet in our study . Study is limited as mutations in gene responsible for Hyperhomocysteinemia along with serum folate and pyridoxine have not been included and further randomized control studies need to be done to determine above findings .

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## Cerebral venous sinus thrombosis and its outcome in a tertiary care referral hospital – An observational study

Presenting author: Arun Kumar B C

**Introduction:** Thrombosis of cerebral veins and sinuses (CVST) is a distinct cerebrovascular disorder. Although it has an excellent outcome in most patients, it remains a diagnostic challenge and a potentially disabling disease. This study was conducted to evaluate the clinical characteristics, risk factors, radiological findings as well as course and prognosis of these patients. **Methods:** This was an observational study conducted over a period of 5 years in Columbia Asia Referral Hospital. The data was collected from an electronic database from January 2010 to July 2014. All patients with cerebral venous sinus thrombosis on Magnetic resonance imaging (MRI) scan were included in the study. Variables recorded were risk factors, outcome, clinical characteristics, and modified Rankin scale (MRS) for disability. **Results:** A total of 30 patients were included in the study. The median age was 41 years (range 17-85 years) and 73.3% of patients were males. The most common symptoms were headache (63%), seizures (46%), and altered sensorium (16%). The most common localizations of thrombosis were the transverse sinus (63%) and the superior saggital sinus (50%). On admission, 36% of patients had hemorrhagic transformation, 8(26.6%) of them showed reduced Vitamin B12 levels and 7(23%) patients had hyperhomocysteinemia. All patients were initially treated with either enoxaparin(80%) or heparin and later were switched to acenocoumarol during the course of the disease. 3 (10%) patients underwent decompressive craniectomy, the reasons for the latter being multiple sinus thrombosis or haemorrhage and admission GCS below 7. On discharge 80% had a good outcome (MRS 0-2). The in-hospital mortality was 13.3%. The mean time for follow-up was 14 months (range 3-38 months), 77% of them had a good outcome (MRS 0-2). Mortality was more with admission GCS less than 6 and multiple sinus infarcts with mass effect. There was a positive association between reduced vitamin B12 and CVST (OR= 1.2). The same association was evident between hyperhomocysteinemia and CVST (OR= 1.1). **CONCLUSION:** In this study, we observed that patients with CVST have a good long term clinical outcome. Vitamin B12 deficiency and hyperhomocysteinemia increase the chances of CVST. Patients with vascular risk factors, low GCS on admission, and the presence of an intracerebral haemorrhage were independent predictors of mortality.

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## Venous thromboembolism risk and prophylaxis in ICU patients in tertiary care hospital in North East India – A comparative study

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**Background:-** Venous thromboembolism is an important cause of increased morbidity and mortality in hospitalized patients.The INDORSE study shows that 67 % of the hospitalized patients are at risk of DVT and only 19 % of the patients given any prophylaxis.Apart from age, obesity and immobility sepsis, stroke, cancer surgery and ortho surgery are regarded high risk factors for DVT. **OBJECTIVE:-** To determine patients at risk of VTE To determine proportion of at risk patients receiving appropriate thromboprophylaxis. To compare with earlier study done between August 2009 and October 2010. **Methods:-** This is a cross-sectional observational study where ICU patients(surgical and medical >18 years) were included .Demographics, VTE risk factors and prophylaxis patterns were assessed based on Caprini 's Risk Assessment Model (RAM). **Results:-** We analysed 674 ICU patients from a hospital in North East India for a period of 9 months from 1st January to 30th September based on review of hospital charts.Of total 674 patients 641 patients (95%) were at risk of VTE with different categories as LOW -188(27.8%), MODERATE -98(14.5%), HIGH -140(20.8%), HIGHEST-215(31.9%). Out of total at risk patients 539 (84%) patients were given prophylaxis. LMWH+GCS-259( 40.4%), Only LMWH-60(9.3%), Only Stockings -98 (15.3%), Early Ambulation -95(14.8%), LDUH+Stockings-16(2.5%), Oral Anticoagulants-11 (1.7%).Among the at risk patients with low, moderate, high and highest risk 166 (88%), 90 (92%), 110 (78%), 173(80%) patients received prophylaxis respectively. **Conclusion:-** (1) More than 50% of ICU patients are at high risk of developing VTE. (2) Increased usage of RAM model for identification of at risk patients. (3) Increased usage of Early Ambulation and Graduated Compression Stockings in

prophylaxis. (4) Increased usage of combination therapy (LMWH+ GCS ) in high risk groups. (5) Overall 16% of at risk patients(62% in the earlier study) and 20% of patients belonging to high and highest risk(50% in the earlier study) didnot receive any prophylaxis.

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## Effect of a Rapid Diagnostic Method (XCyton) in optimising antimicrobial therapy among critically ill adults

**Presenting author:** Srinivas Samavedam

**Aim:** To evaluate whether rapid diagnostic techniques optimise antimicrobial therapy among critically ill adults **Material and Methods:** This was a prospective observational study done in a tertiary referral hospital. All patients with clinical diagnosis of sepsis where microbiology was unyielding or inconclusive were chosen for inclusion into this study. Ethics committee waiver was taken for consent. The study was conducted over a one year period from September 2013 to September 2014. Samples relevant to the suspected source of sepsis were sent to the centralised analysis centre in EDTA tubes. Primary endpoint was change in antimicrobial therapy. **Results:** A total of 21 samples were sent for molecular diagnostic techniques. Blood and respiratory specimens were the most commonly investigated specimens. Pneumonia and Occult sepsis were the most common situations where these tests were asked for. The turnaround time for routine cultures was 49.66 hours. Rapid diagnostic methods returned results in 28.78 hours. Microbiology and Molecular diagnostics correlated in 5 /21 samples. Treatment change was dictated by the molecular diagnostics in 17 /21 patients. Addition of newer agent was the most common change. De-escalation was facilitated in 3/21 instances. Undiagnosed infections were identified on 8/21 occassions. Acinetobacter was identified in 9/21 samples where routine cultures did not yield the same result. **Conclusion:** Rapid diagnostic method returned results quicker than conventional cultures. The tests facilitated change in antimicrobial plan in a high percentage of patients.

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## Effect of endotracheal tube with subglottic suction port versus standard endotracheal tube on incidence of ventilator associated pneumonia in patients admitted in Intensive Care Unit

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**Introduction:** Micro-aspiration of subglottic secretion is one of the postulated causes of Ventilator Associated pneumonia (VAP). Endotracheal tubes with subglottic suction port (ETT SS) have been used with varying degrees of success in reducing VAP. We hypothesized that use of ETTSS reduces the incidence of VAP when compared with standard Endotracheal tube (ETT C). **Methods: setting:** The study is being done on patients admitted to the Surgical ICU in Christian Medical College Vellore, Tami Nadu, India. **Study design:** ETT SS is the standard of care when patients are intubated in our ICU, whereas the patients who are intubated in other areas of the Hospital ETTC. A prospective observational study was planned and after institutional ethics committee, Adult patients admitted to ICU with duration of ventilation >48 hrs were recruited. Demographics, co-morbidities, APACHE II score, ventilator days, ICU & hospital stay and mortality were noted. Primary outcome was incidence of VAP. Secondary outcomes were duration of mechanical ventilation, ICU and Hospital length of stay and in Hospital Mortality, Surveillance for VAP and other Ventilator Associated Events (VAE) was in accordance with the CDC's latest Surveillance for ventilator - associated events in the National Healthcare Safety Network Jan 2014 guidelines. The new guideline uses objective criteria and has removed subjective criteria like chest X-ray. Based on observations, the new definitions classify Ventilator associated events (VAE), Ventilator associated Condition (VAC), Probable and Possible VAP. **Statistical methodS:** The calculated sample size was 160 patients. The incidence of VAP was compared using two sample proportion test. The association between the clinical variables and VAP was analyzed using Chi-square test. Logistic regression analysis was used for relative risk and 95% CI. Descriptive statistics and frequencies were used to represent all the variables. SPSS 17.0 software is used for data analysis. **Results:** An interim analysis of data on this ongoing study was done. Of the 88 patients enrolled, 43 were in ETT SS group and 45 in ETT C group. The patients in ETSS group were older, had higher incidence of Hypertension and Diabetes Mellitus and had a higher APACHE II score. The incidence of VAP in our ICU was 4.24 per 1000 ventilator days. The incidence of VAP was lower in ETT SS (0 %) compared with ETT C group (4.44%). This was not statistically significant, but has clinical significance. The incidence of VAE in the two groups was similar as there were 5 (11.6 %) in ETT SS group vs. 3 (6.6 %) in ETT C group. Number of ventilator days, ICU stay and in-hospital mortality were higher in ETT SS group.

| Incidence | Type of ET tube used | | *P* value |
|---|---|---|---|
| | ETT SS | ETT C | |
| VAP | 0/43 | 2/45 | |
| VAE | 5/43 (11.6%) | 3/45 (6.6%) | 0.41794 |

**Discussion:** The interim analysis shows a trend of reduced incidence of VAP with use of ETT SS, though they were ventilated longer, were older and had more co-morbidities. The mortality among this group was higher but this clearly is not related to pneumonia. The higher mortality may be related to the comorbidities and the higher sickness score. The study will be adequately powered when the required number (160) of patients are recruited. **Conclusion:** In our observational study, use of ETT SS showed a trend towards reduced incidence of VAP in comparison with ETT C.

**52**

## "A study of isotonic fluids versus hypotonic fluids as maintainence fluid therapy in paediatric intensive care unit of the tertiary care hospital"

**Presenting author:** Hajira T Majeed

**Introduction:** The optimum choice of of IV fluids in critically ill children remains a matter of concern. Holliday Segar recommendations, developed 6 decades back continues to be the guideline in practice despite it being an hypotonic fluid with risk of symtomatic hyponatremia and resultant mortality and neurological morbidity. There has been a significant shift towards using isotonic fluids in recent times. In this background this study was undertaken. **Methods:** A randomised, prospective study was done in paediatric intensive care unit of the tertiary care hospital from November 2012 to April 2014. 200 children were randomised into 2 groups. Group A (102) received isotonic fluid(normal saline) and Group B (98) received hypotonic fluid(5%isolyte-P). The children were assigned to either group A or group B as per the random number table for maintenance intravenous therapy. The maintenance fluid volume administered is as per the volumetric Holliday– Segar formula[1]. Serum electrolytes, blood glucose and blood pressure were measured at 0, 6 and 24 hours after beginning of fluid therapy. Plasma creatinine and urine electrolytes concentration was measured at 6hrs. **Results:** During the study period, total of 200 patients that were admitted to PICU satisfied the inclusion criteria and were included in the study.74 were females and 126 were males and were between the age groups of 1month to 16yrs.The principal outcome parameter studied was incidence of hyponatremia in both groups. At 6 hours, 36 % of patients in isotonic group had serum sodium level less than 135 as compared to 63.8% of patients in hypotonic group (p=0.002). At 24

hours, 27.6% of patients in isotonic group had serum sodium level less than 135 as compared to 72.3% of patients in hypotonic group (p<0.001). There was statistically significant difference between the two groups [NS Vs IsoP] in terms of occurrence of hyponatremia [137.19±3.03 Vs 134.35±3.23]. There were no adverse event noticed in either of the groups **discussion:** Isotonic fluid, similar to the body fluid composition is the most appropriate fluid of choice for maintenance therapy for critically ill children in Paediatric Intensive Care Units. Hypotonic fluids with significant risk of hyponatremia and consequent risk of neurological morbidity and mortality should be avoided. The limitations of the study was the study subjects were studied only till 24 hours and the effects of fluid therapy beyond 24 hours' were not analysed.Snce there is significan risk of hyponatremia in patients receiving hypotonic fluids, isotonic fluids should be the preferred choice for maintainence fluid therapy in an intensive care setting. **Key words:** hypotonic; isotonic; hyponatremia; IV fluids.

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## Incidence and identification of risk factors for the occurrence of adverse events during intra-hospital transport of critically ill patients in an Indian tertiary care hospital – A pilot study

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**Introduction:** Transport of critically ill ICU patients in a tertiary level hospital for various diagnostic and therapeutic procedures is inevitable. Adverse events may have a bearing on the morbidity and mortality of these patients. Sparse data on this subject in Indian patients prompted this pilot study. The study aimed to establish the incidence and identify the risk factors for adverse effects during intra-hospital transport of critically ill. **Methods:** A prospective observational study of all intra-hospital transports for critically ill patients in the ICU was performed from October 1, 2014 to November 30, 2014. Data collection was done using a proforma for every transport in this period. Data collection included patient demography, adverse events divided under pre-determined categories, interventions done and other details. Analysis was done using SPSS software version 11.5. By uni-variate analysis, we tried to ascertain the impact of few variables as potential risk factors in the occurrence of these events. **Results**: 100 intra-hospital transports occurred during this 2-month period in our ICU. 93% were for diagnostic radiological imaging .The remaining 7% (excepting 1) were for therapeutic angiographic procedures. 73% of patients who underwent transport were ventilated. The mean age of patients requiring transport was 51.22±18.23 years, with male: female ratio of around 2:1. Adverse events occurred in 28% of patients. The same were arbitrarily categorized as shown in the table below:

| Adverse event | Number |
|---|---|
| Equipment related | |
| Monitor related | 2 |
| Saturation probe related | 3 |
| Infusion pump related | 3 |
| Respiratory equipment | 3 |
| Patient related | |
| Fall in saturation | 3 |
| Variation in BP | 9 |
| Cardiac arrhythmias | 2 |
| Cardiac arrest | 3 |
| Sedation/paralysis wean | 4 |
| Altered mental status | 1 |
| Line related | 4 |
| Airway related | 1 |
| Delay in transport | 1 |
| Transport abort | 1 |

Patient related major adverse events that occurred included variation in blood pressure in 22.5%, weaning of sedation/paralysis in 10%, fall in saturation in 7.5%. 3 patients (3%) had cardiac arrest requiring CPR. No deaths occurred during the transports.

Association of Risk factors in predicting adverse events during transport:

| Parameter | Adverse events (%) | *P* value |
|---|---|---|
| Nursing experience | | |
| >1 year | 21.7 | 0.141 |
| <1 year | 32.1 | |
| Vasopressor | | |
| Yes | 34.3 | 0.354 |
| No | 24.6 | |
| Dialysis | | |
| Yes | 28.6 | 0.819 |
| No | 26.2 | |
| APACHE II-No co-relation found | | |
| PEEP | | |
| 5 | 24.5 | 0.442 |
| 5-8 | 26.8 | |
| >8 | 20 | |

**Discussion:** In this study the incidence of adverse events was 28%. 22 adverse events were serious enough requiring urgent therapeutic intervention. The incidence of adverse events in this study is in concordance with the results of other studies. In different studies, the occurrence of cardiac arrest ranges from 0.34% to 1.6%, as against 3% in our study. We found no association between the development of adverse events and the presence of risk factors. **Conclusion** The incidence of adverse effects for intra-hospital transport of the critically ill was around 28% with 3 patients even requiring CPR. However, we found no significant association between the presence of risk factors and the incidence of adverse events.

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## Patient profile in a tertiary level multidisciplinary indian ICU

**Presenting author:** Nithya C A

**Introduction:** Despite the growing number of critically ill patients in India, there is very sparse data on the clinical profile of critically ill patients in the country. This is further compounded by the absence of a national database and poor reporting culture in the country. We thus conducted this study in our multi-disciplinary intensive care unit. **Methods:** A retrospective analysis of all patients admitted to our 26-bed multi-disciplinary intensive care unit during the one-year period from 1st November 2013 to 31st October 2014. Data was collected from the ICU database and further analysis performed. **Results:** This study was performed in a 26-bed tertiary Multi-disciplinary ICU, situated in a 600-bed multi-specialty tertiary hospital in a large metropolitan city. A total of 1857 admissions occurred in this 12-month period, with an average of 5.08 admissions per day. A male preponderance was noted with a male: female ratio of 1.7:1. Average age of admission was around 53.04 years.

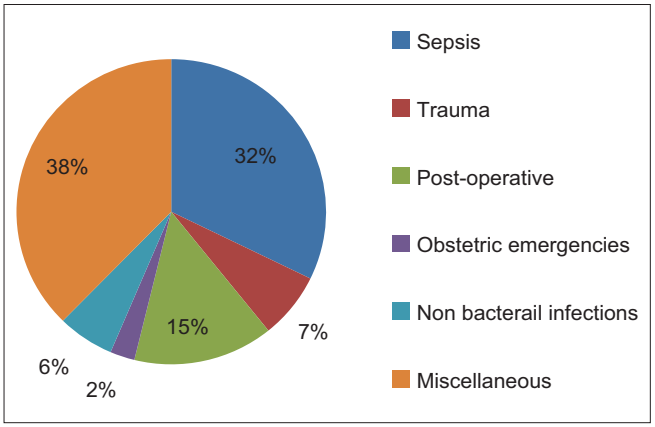


Fig – 1:

Of the 1857 patients, 34% (636 patients) were admitted with bacterial sepsis, 15.6% (289 patients) were admitted after elective surgeries for post operative management, 6.3% (118 patients) were admitted with non-bacterial infections and SIRS (like Dengue, malaria or other arbo-viral illnesses). Trauma formed 7.4% (138 patients of admissions) with at least 63% of these patients having varying forms of Traumatic Brain injury. Obstetric emergencies contributed to 2.7% (51 patients) of admissions. Sepsis thus seems to be the commonest cause of admission in our ICU. Further analysis of the data revealed that 41% of our patients had respiratory source followed by genito-urinary, abdominal and others (Fig-2)

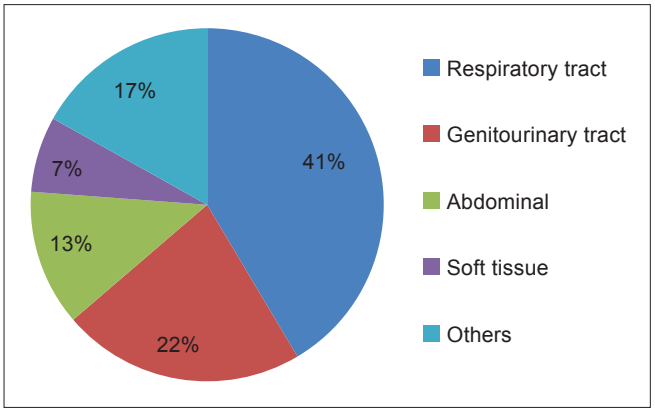


Fig-2

The total number of deaths during this period was 340 amounting to overall mortality rate of 18.3%. The average length of stay in this period was 4.38 days. **DISCUSSION** This study was done in a multidisciplinary ICU with a large referral base. The aim of the study was to look into the epidemiology of ICU admissions. The incidence of sepsis in our study was 34% which was similar to the SOAP study (Ref). Of these, respiratory tract was the most common source of infection contributing to 41.3% of the total no of cases, followed by genitourinary tract (22.16%), abdomen (12.42%), soft tissue (6.91%) and others including blood stream infections with unknown source (17%). In comparison, Ghanshani et al reported that lung contributed to 46% followed by those in blood (23%), urine (16%) and soft tissue (9%). Non bacterial infections namely dengue, malaria and other arbo-viral infections had an incidence of 6.3% which is more than the rate recorded in the EPIC II study. Despite the results, this study has the limitation of being a single centre study. Wider multicentre observational studies across different ICUs or a national data base is essential to understand the epidemiological profile of ICU admissions in our country. Thus in conclusion, the profile of admissions to a tertiary level ICU, with a large referral base seems to be similar to ICU admissions in other parts of the world. Sepsis seems to be the most common cause of admission to the ICU, with respiratory system being the most common source.

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## C-reactive protein a tool to predict neonatal sepsis in term and preterm neonates

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**Introduction:** Neonatal Sepsis is considered as a clinical syndrome of bacteremia with systemic signs and symptoms of infection within first 28 wks of life . As we know that bacterial infections contribute significantly to morbidity and mortality in newborn infants. Successful treatment depends on early initiation of appropriate antibiotic therapy but early diagnosis of neonatal infection is difficult because clinical signs are non specific and initially may be stable . It is generally categorized as early or late onset. 85% of newborns with early onset infection present within 24 hrs, 5% present at 24-48hrs and remaining present between 48hrs and 6 days of life . Early onset sepsis syndrome is associated with acquisition of micro-organisms from the mother . Late onset sepsis syndrome occurs at more than 7 days of life. We have very few modalities for investigation of neonatal sepsis, positive Blood cultures still remains the gold standard for the diagnosis of sepsis, but many times the cultures may be negative even in symptomatic neonates. When blood culture is negative we have to depend on the other parameters for the diagnosis of neonatal sepsis . These test should be economical, fast and reliable. One of these is c-reactive protein which is supposed to be very specific for neonatal sepsis. **AIMS:** To correlate CRP with blood culture. To estimate CRP in neonatal sepsis . **Methods:** 100 neonates with suspected neonatal sepsis admitted to HMCH, NICU during the study period 11th jan 2014 to 11th jan 2015. The subjected of this study were divided into two groups. GROUP 1 TERM NEONATES (37 and >37wks). GROUP 2 PRE-TERM NEONATES <37 Wks each of 50 in number. Babies born to mother with history of fever before delivery and PROM were included in the study . Mother with history of antibiotic usage during labor or if the neonate died within the study period in NICU or if babies age is of more than 28 days were excluded from the **study** .All the babies were subjected to septic screening i.e CRP, Blood culture, CBC, PSC and CSF Study for meningitis suspected cases. **Results:** CRP is the rapid diagnostic test which has high sensitivity in diagnosis of neonatal sepsis. CRP can be considered in both preterm and term babies. Gram negative was commonest in HMCH NICU . Male sex predominate was noticed . Respiratory distress is the most common chief complaint followed by refusal to feeds. Out of 100 suspected neonates 83 cases had positive for CRP.

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## ICU admissions, has triaging patients helped?

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Background The emergency department is the crucial interface between the emergency medical services and the ICUs. Appropriate utilization of Intensive Care Unit (ICU) resources is an important issue. Because the volume of patient admissions to an emergency department (ED) cannot be precisely planned, the available resources may become overwhelmed at times ("crowding"), with resulting risks for patient safety. This was a prospective study done over 2 years in our hospitals. **Aims and Objectives of the study** To study the, Effectiveness of ED triaging on ICU admissions. Reliability the triage instrument used in our hospital emergency. **Methodology** All Emergency Department patients will be initially assessed by the triage nurse and Intern and initiate emergency care according to the patient's Urgency Level Rating, as defined by 3 level priority category . Appropriate color sticker would be placed on the file. Subsequent triage will be done by the consultant/resident attending the patient. **Results:** As reflected in the year-on-year increases in patient numbers, triaging remained effective. Initial triage was done within 5 min of patient arrival. Some triage instruments (CTAS, ATS, MTS) set time limits by when a certain proportion of patients, depending on treatment priority, must have been evaluated by a doctor. The introduction of structured triage by trained nursing staff (all) in the emergency department helped to accurately identify patients whose lives are endangered and are fast tracked to the ICU consistently. Details of results will be presented in the conference. **Conclusion** The triage assessment will generally take no more than two to five minutes. The triage assessment is not necessarily intended to make a diagnosis, although this may sometimes be possible. The reliability or replicability of the results was shown to be as high and correlated with the subsequent triage done by the doctors.

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## Are vital signs strongly associated with admission to Intensive Care Unit

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**Introduction**: Triage of patients is critical to patient safety, yet no clear information exists to find utility of initial vital signs in identifying critically ill patients requiring ICU admission in emergency department. **Objective**: The aim of this study was to quantify admission to Intensive Care Unit (ICU) and to identify the vital signs that are most strongly associated with the outcome measures. **Methods**: A prospective study was under taken in patients seen in the emergency department from Jan 2014 –Dec 2014 at M S Ramaiah Memorial hospital. Patient's demographic data, clinical information along with vital signs were noted. We used bivariate analysis to investigate the relationship between vital sign abnormalities and severe illness or injury, defined as intensive care unit (ICU) admission criteria. **Results**: Our initial analysis shows the presenting complaints associated with the highest admission to ICU and in house hospital morbidity and mortality were dyspnoea and GCS< 8 . The vital signs best predicting in-hospital admission to ICU were saturation peripheral oxygen (SpO2), respiratory rate (RR), systolic blood pressure (BP) and Glasgow Coma Score (GCS). The complete results will be presented in the conference. **Conclusion**: Abnormal vital signs are strongly associated with admission to Intensive Care Unit (ICU) and dyspnoea and low GCS as presenting complaints was associated with the highest admission to our hospital ICU.

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## Determination of synergy between sulbactam, carbapenem and colistin in carbapenem resistant *Klebsiella sp., Pseudomonas aeruginosa* and *Acinetobacter baumannii* isolates

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**Background:** The emergence of carbapenem resistance has highly restricted the options for treatment especially in the intensive care units. These isolates are also often multi- or extensively drug resistant. This *in vitro* study aims to determine the presence of synergy between different antimicrobial combinations against these resistant isolates. **Materials and methods:** Fifty clinically significant non-duplicate isolates each of carbapenem resistant (CR) *Klebsiella sp., P. aeruginosa* and *Acinetobacter baumannii calcoaceticus complex* (Abcc) were collected from either blood or respiratory samples. MIC for meropenem and colistin were determined by microbrothdilution. In addition MIC for sulbactam was determined by microbrothdilution for Abcc isolates. Synergy of drug combination was tested by checkerboard assay (CBA) and the reference time kill assay (TKA) at sub-inhibitory concentration. The combination of meropenem plus colistin was tested for *Klebsiella sp.* and *P. aeruginosa* and meropenem plus sulbactam and colistin plus sulbactam for Abcc isolates. **Result:** MICs of colistin showed within the susceptible range for all *P. aeruginosa* and Abcc isolates. Breakpoints for *Klebsiella sp.* is not defined in the CLSI guideline. However, 8/50 (16%) of *Klebsiella sp.* had MIC in the resistant range using the EUCAST breakpoint of > 2μg/mL. There is no breakpoint for sulbactam for Abcc isolates but MICs were in the higher range from 16 – 128 μg/mL considered resistant. CBA detected synergy of 32% (16/50) with both combination of sulbactam plus meropenem and sulbactam plus colistin for Abcc. The combination of colistin plus meropenem showed synergy of 18% and 15% for *Klebsiella* and *P. aeruginosa* isolates respectively by CBA. TKA detected 58% synergy and 78% bactericidal effect with sulbactam plus meropenem combination for Abcc. The combination of sulbactam plus colistin showed 22% synergy and 98% bactericidal activity. TKA with meropenem plus colistin combination showed synergy in 46% and 76% of *Klebsiella* and *P. aeruginosa* respectively. However, the bactericidal activity of meropenm plus colistin combination was more in *Klebsiella* (100%) than in *P. aeruginosa* (69%). No antagonism was detected in any of the combinations for any of the isolates by either CBA or TKA. Abcc isolates from the sputum samples showed more synergy with the meropenem plus sulbactam combination (75%) compared to blood isolates (50%). **Conclusion:** The present study demonstrates moderate levels of synergy *in vitro* with the combinations tested, with good bactericidal activity. The findings of the study support the use

of combination therapy for infection with CR-GNB, even though the isolate may be resistant to one of the agent in the combination. The use of combination therapy may also make permissible the use of lower dosage of drugs with low therapeutic index like colistin with its nephrotoxic effect. The effects of combination therapy needs to be studies further in *in vitro, in vivo* and clinical trials to formulate acceptable treatment protocols especially for patients under critical care.

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## Dexmedetomidine as an adjunct in postoperative pain following cardiac surgery- A randomized, double- blind study

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**Co-authors:** Dr. Shio Priye, Dr. Sathyanarayan J, Dr. Shiva Prakash,, Dr. Bhaskar B V, Dr. Kadli CU, Dr. Durga P Reddy
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**Background:** The purpose of this study was to determine the hemodynamic effects and efficacy of dexmedetomidine used as continuous infusion without loading dose in post cardiac surgery patients. **Methods:** Sixty-four patients scheduled for elective cardiac surgery consented to participate in the study. Patients with elevated serum creatinine, ejection fraction less than 40% and diabetes mellitus were excluded. After shifting to post anaesthesia care unit(PACU) patients were prospectively randomized in a double-blind fashion into one of two groups. Group A (n=32) received a 12 hour infusion of normal saline and group B (n=32) received a 12 hour infusion of dexmedetomidine 0.4 µg/kg/hr. All patients received a standard premedication inj diazepam 0.1mg/kg 45minutes before shifting to operation room(OR) and anaesthetic consisting of midazolam, fentanyl, propofol and vecuronium. Postoperative pain was managed with IV fentanyl. Total fentanyl consumption, hemodynamic monitoring, visual analogue scale (VAS) pain ratings, Ramsay sedation scale were charted every 6$^{th}$ hourly for 24 hours postoperatively and followed up till recovery from PACU. Results are reported as mean ± standard deviation. Student's t test, chi-square /fisher exact test has been used to find the significance of study parameters on categorical scale between two or more groups. **Results:** Dexmedetomidine treated patients had significantly less VAS score at each level. Total fentanyl consumption in dexmedetomidine group was 128.13± 35.78 µg versus 201.56±36.99 µg in saline group (P <0.001). A statistically significant but clinically unimportant sedation was noted at 6 and 12 hour (P<0.001, and P=0.046 respectively).Incidence of delirium was less in dexmedetomidine group (P=0.086+). Hemodynamic parameters were statistically insignificant. **Conclusion:** Dexmedetomidine use by omitting the loading dose is an effective adjunct analgesic, mild sedative and benefits in reducing delirium without undesirable hemodynamic effects in cardiac surgery patients.

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## Vap care bundle, an efficient tool to reduce vap: Experience from a tertiary care ICU in Kolkata

**Presenting author:** Dr.V Ruth Adora Rao,
**Co-author:** Dr Avijatri Datta, Dr Arindam Kar, Dr Tanmoy Banerjee

**Introduction**: Ventilator Associated Pneumonia (VAP) may develop in patients who are mechanically ventilated for 48 hours or more and usually occurs when lungs are invaded with pathogens and on aspiration of oral secretions. 10-20% of patients receiving mechanical ventilatory support for 48 hours or more develop VAP resulting in an increase in ventilator days, ICU length of stay, mortality and economic burden. VAP rate is an important ICU quality indicator. **Methodology**: Our study included all mechanically ventilated patients for more than 48 hours in three Level III ICUs of a tertiary care hospital in Kolkata from January- April 2014(pre interventional group). VAP was diagnosed using modified CPIS scoring and calculated per 1000 ventilator days. ICU Length of stay, Standardized Mortality Ratio was calculated. RCA was done and corrective and preventive actions were taken by devising and implementing an **ALL or NONE 6 element VAP care bundle** which was maintained in each shift and documented with adequate educational training and care supervision throughout the interventional period and following which similar data was collected from July – October 2014 and comparison was made between pre and post intervention groups. **Results**: Comparison between the pre intervention and post intervention group was done after implementation of **ALL or NONE 6 element** intervention **VAP care bundle**. Results showed significant improvement in post interventional group as evident by decrease in ventilator days, ICU Length of stay and SMR.

| Parameters | Pre intervention | Post intervention |
|---|---|---|
| Average age in years | 65.3 | 66.1 |
| APACHE IV | 91 | 97 |
| Average ICU LOS | 6.71 | 5.98 |
| Ventilator days | 475 | 389 |
| VAP rate | 8.77 | 4.71 |
| SMR | 1.14 | 1.05 |

**ALL or NONE 6 element** intervention VAP care bundle included the following

| Elements of the devised VAP care bundle |
|---|
| Elevation of bed head end |
| Daily "Sedation Vacations" and assessment of readiness to extubate |
| Peptic ulcer disease prophylaxis |
| Deep venous thrombosis prophylaxis |
| Daily oral care with chlorhexidine |

**Conclusion**: Strict compliance with **ALL or NONE 6 element** VAP bundle is an effective method for reducing VAP rates, however strict surveillance and audit is vital in making the change sustainable. The demography and severity of the pre and post intervention groups were comparable. Our study results are similar to other Indian studies conducted in North India. Significant change in patient outcome as noted in pre and post intervention groups possibly reflects the efficacy of the care bundle. Similar studies need to be conducted in Eastern India to generate more data on VAP rate, Care bundle and outcome. **Limitations**: Shorter duration of study period

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## Improving hand hygiene compliance leads to improved health outcome - An analysis

**Presenting author:** V Ruth Adora Rao,
**Co-author:** Dr. Avijatri Datta, Dr. Arindam Kar, Dr. Saurabh Debnath, Dr. Ahsan Ahmed, Dr Sauren Panja

**Introduction:** Hand hygiene is the single most effective but least practiced action in breaking the chain of transmission of microbes. Studies have shown a correlation between the compliance of hand hygiene and its impact on the health outcome. **Methodology**: A Quasi experimental study was done in three level III ICUs of a tertiary care hospital in Kolkata from (January – April 2014). Data was collected on existing hand hygiene compliance rate, Ventilator Associated Pneumonia (VAP) rate, Catheter Related Blood Stream Infection (CRBSI) rate, Catheter related urinary tract infection (CAUTI) rate, Standardized Mortality Ratio (SMR) and average ICU length of stay in the above mentioned units. Root cause analysis was done and interventions were developed to improve hand hygiene compliance and was implemented (July – October 2014). **Comparison** was done

between pre intervention and post intervention periods. **Results** In the pre intervention period (January – April 2014) the hand hygiene compliance among the care givers was found to be 40%, VAP rate (8.77), CRBSI rate (3.42), CAUTI rate (5.27 ), SMR (1.14) and average ICU length of stay was 6 days± 5.85 SD (median 4.5). Interventions were developed and implemented as mentioned in the table below-

| |
|---|
| Education and awareness-Road shows |
| Positive reinforcement |
| Secret watch nurse |
| e-ICU-electronic surveillance |
| Ring the bell once every hour-baseline hand hygiene |
| Visual reminders |
| Availability of ABHR, soap and water and sinks |
| Compliance audits |
| Random hand swabs |

In the post intervention period (July- October 2014) data showed a significant improvement in the hand hygiene compliance (75%). Further analysis showed an association with decrease in the incidence of VAP rate (4.71) CAUTI rate (3.51) CRBSI rate (2.65), SMR (1.05) and average ICU LOS 5.05 days±4.03SD (median 4). **Conclusion** Improved hand hygiene compliance can be attributed to decreased incidence of VAP, CRBSI, CAUTI, SMR and average ICU LOS. This does definitely impact the overall clinical outcome. However continued surveillance of hand hygiene compliance and regular audits is of utmost importance to make the change sustainable. **Limitation**: Hand hygiene compliance improved outcome but RCA focused on multiple interventions put together, hence effectiveness of each intervention separately is not defined.

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## Identifying nutritional practices by digital photography

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**Introduction**- Digital Photography of Foods method involves using a digital photography to capture food selection before eating and plate waste after finishing. The photographs are analyzed to estimate amount of food selection and plate waste with calculation of calories and protein intake. **Methodology**- A single day, single meal point prevalence study was done in a tertiary care hospital using digital photography of foods method. 55 Patients who were only on oral feeds were selected. The entire group was divided into 3 subgroups (A, B, C) based on location. Prescribed calorie and Protein calculation was done individually based on baseline risk. Analyses were carried out in all groups using unpaired student t test and p value <.05 was considered significant. **Results**-In the **entire group (55**) mean Prescribed Calorie 447.76±95.56SD (Median 460), mean Prescribed Protein intake 20.38gram±4.84SD (Median 22), mean Actual Calorie intake 261.16±118.93SD (Median 251), mean Actual Protein intake 12.77gram±6.40SD (Median 12.5), mean Calorie deficiency 186.6±136.37SD (Median 180), mean Protein deficiency 7.62gram±6.54SD (Median 6). In **subgroup A (15**) mean Prescribed Calorie 476.7±55.25SD (Median 470), mean Prescribed Protein intake 22.07gram±2.61SD (Median 24), mean Actual Calorie intake 206.2±111.23SD (Median 210), mean Actual Protein intake 10.73gram±6.74SD (Median 9.5), mean Calorie deficiency 270.47±100.19SD (Median 220), mean Protein deficiency 11.33gram±7.03D (Median 11). In **subgroup B (28)** mean Prescribed Calorie 443.75±78.91SD (Median 455), mean Prescribed Protein intake 20.38gram±4.32SD (Median 21), mean Actual Calorie intake 299.93±109.93SD (Median 316.5), mean Actual Protein intake14.72gram±5.79SD (Median 15.5), mean Calorie deficiency 143.82±137.41SD (Median 107.5), mean Protein deficiency 5.66gram±5.45D (Median 4). In **s**ubgroup **C** (12) mean Prescribed Calorie 421±153.93SD (Median 425), mean Prescribed Protein intake 18.29gram±7.22SD (Median 22), mean Actual Calorie intake 239.42±124.79SD (Median 235), mean Actual Protein intake 10.75gram±6.43SD (Median 12.25), mean Calorie deficiency 181.58±133.78SD (Median 170), mean Protein deficiency 7.54gram±6.76D (Median 6.25). Significant statistical differences in Prescribed Calorie vs. Actual Calorie intake was noticed in entire group (p<.0001), subgroup A (p<.0001), subgroup B (p<.0001) and subgroup C (p=.004). Prescribed protein vs. Actual Protein intake was statistically significant in entire group (p<.0001), subgroup A (p<.0001), subgroup B (p=.0001) and subgroup C (p=.013). **Conclusion**- Nutrition is an essential component while treating clinically ill patients but is often overlooked. **Limitation**- Varying sample size, patients with varying baseline risk selected and possible selection bias.

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## Lung ultrasonoraphy versus chest xray in detecting pneumothorax: A case series

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**ABSTRACT: INTRODUCTION:** Thoracic imaging is regularly performed on the majority of critical care patients. Conventionally, this uses a combination of plain radiography and computed tomography. There is growing enthusiasm for the use of ultrasound to replace much of this radiology and provide more immediate, point-of-care imaging with reduction in patient transfers, ionizing radiation exposure and cost. Current evidence suggests that, in expert hands, thoracic ultrasonography has similar diagnostic accuracy to computed tomography in pleural effusion, consolidation and pneumothorax. We studied 3 cases of pneumothorax in critical care setting and compared the accuracy of diagnosis with ultrasound versus chest x-ray. **MethodS:** 3 adult patients were studied in whom pneumothorax was suspected. Chest x-ray was done in all at the first suspicion, followed by serial lung ultrasounds. BLUE protocol was followed in doing the lung ultrasounds. Scanning was done in postero-lateral-anterior segments. 4 signs were specifically looked for: absence of lung sliding or the stratosphere sign, absence of B-lines, presence of A-lines and presence of lung point, for detection of pneumothorax. **Results:** In all 3 patients, lung ultrasound proved more accurate and sensitive than chest x-ray. In the 1st patient, who was mechanically ventilated, pneumothorax was evident in both lung usg and chest x-ray but the lung point on usg helped in defining the margins of the pneumothorax which aided in the accurate insertion of the ICD. In the 2nd patient, also mechanically ventilated, chest x-ray had ruled out pneumothorax but on lung usg, pneumothorax diagnosis was established and timely ICD inserted. In the 3rd patient, pneumothorax suspected in the immediate post-operative period. Diagnosis of pneumothorax confirmed by bedside lung usg and findings later duplicated in chest x-ray. ICD was placed immediately after confirmation of diagnosis by lung usg. **CONCLUSION:** In this series of 3 patients in critical care setting, we have seen that lung ultrasound has proven to be a faster, more accurate and sensitive bedside tool in diagnosing and following up pneumothorax as compared to chest x-ray.

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## A study to compare the efficacy and safety of prolonged sedation with dexmedetomidine vs midazolam for mechanically ventilated patients in the intensive care

**Presenting author:** Ashish Kumar

**Introduction –** Patients admitted to the ICU are usually in need of invasive and uncomfortable interventions such as mechanical ventilation. Providing sedation to patient results in reduced anxiety

and increased tolerance to such interventions. Sedation is an integral component of bedside care for providing pain relief and maintaining patient calm for nearly every patient in the intensive care unit. (ICU). Traditionally, sedative agents administered in the ICU are -aminobutyric receptor agonists (GABA) which include benzodiazepines like midazolam. Dexmedetomidine is an adrenoreceptor agonist which acts on locus ceruleus and spinal cord and exerts anxiolytic and sedative effects without respiratory depression. **Methods –** This study was done on 40 patients in the ICU of Dr. Vasantrao Pawar Medical College, Nashik.They were divided in two groups of 20 each, one group of 20 received dexmedetomidine for sedation and the other 20 received midazolam for sedation. Eligible patients were 18 years and older, intubated and mechanically ventilated for more than 24 hours and expected to require ventilation and sedation for atleast 3 more days. Exclusion criteria was burns, acute hepatitis, dialysis of all types, pregnant, neuromuscular blockade, any planned surgery after 24 hours, serious central nervous system pathology like stroke, uncontrolled seizures, severe dementia, unstable angina, acute myocardial infarction, heart rate less than 50/ minute, left ventricle ejection fraction less than 30 %, second or third degree heart block, systolic blood pressure less than 90 mm hg. Detailed information regarding sedative and analgesic therapy prior to initiation of study drug, severity of illness were obtained after consent was signed. Each patient received the drugs 24 hours after intubation. Sedatives used before were discontinued before study and patients were required to be within the Richmond Agitation Sedation Scale (RASS) target range of -2 to +1 at the beginning of the study. 20 patients received dexmedetomidine in loading dose of 1mcg/kg and followed by maintenance dose of 0.5mcg/kg/hour. Another 20 patient received midazolam at loading dose of 0.05mg/kg and followed by maintenance dose of 0.05mg/kg/hour. Study drug infusion was stopped at time of extubation in both group. **Results -** The percentage time of both the group within the target sedation range (RASS score -2 to +1). The prevalance of delirium during treatment was 55% (n=11/20) in dexmetomidine treated patients vs 76.6% (n=15/20) in midazolam treated patients. Median time of extubatation in dexmedetomidine sedated patients was 3.7 days and for those sedated with midazolam was 5.5 days, which is 1.8 days shorter in dexmedetomidine treated group. The length of ICU stay was 5.9 days for patients with dexmedetomidine and 7.6 days for midazolam treated patients which is 1.7 days shorter in dexmedetomidine treated patienst. The incidence of bradycardia was 40 % in patients sedated with dexmedetomidine (n=8/20) and in patients sedated with midazolam was 15% (n=3/20) which is nonsignificant. **Discussion -** The targeted sdatation level in both group of patient treated with dexmedetomidine and midazolam is same. At comparable sedatation levels, dexmedetomidine treated patient patients spent less time on ventilator, experienced less delirium and developed less tachycardia and hypertension. The length of ICU stay in patients sedated with dexmedetomidine was decreased.The most notable adverse effect of dexmetomidine was bradycardia.

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## Case report: Imidacloprid poisoning: Common poisoning in rural area, uncommon for urban doctor

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**Introduction** Newer systemic insecticide, a nicotine analogue Used for cotton, paddy, sugarcane, okra, mango crops etc Used against Aphids, White fly, Jassids, Thrips & Termite Variable manifestations like irritability, labored breathing, emaciation, twitching and delirium. Used as 50 to 100 ml per acre of land. Blocks the signals induced by acetylcholine at the post-synaptic membrane, resulting in impairment of normal nerve function higher binding strength to insect nerve receptors than to mammalian receptors **Case report** A 48 year female transferred with alleged history of ingestion of some insecticide. Admitted at Bayad 3 days back, intubated & ventilated. Being managed as a case of OP poisoning.
Referred to higher centre since there was worsening with anuria & hypotension
On arrival started on inotropic support.
Relatives revealed that she had consumed IMIDACLOPRID 17.8 % insecticide of expiry date
ABG showed metabolic acidosis with $HCO_3^-$ of 12 started on $NaHCO_3$ infusion.

Repeat ABG done after 5 hours showed $HCO_3^-$ of 7 so was immediately started on dialysis. During dialysis she has hypertension, norad omitted & NTG started. Despite daily dialysis for 2 days she remained anuric & had hyperkalemia with rising serum creatinine & had arrhythmias Went into refractory shock despite maximum inotropic support & had cardiac arrest from which she could not be revived & declared expired within 48 hours of admission. **Discussion** Neonicotinoids: Imidacloprid, Acetamiprid, Clothianidine, & Thiocloprid Classified as a "moderate toxic" (class II by WHO and toxicity category II EPA)[1] It is not banned, restricted, cancelled, or illegal to import in any country. [2] In a prospective human case series of 68 cases, majority developed mild gastrointestinal symptoms and only one required mechanical ventilation for respiratory failure. [3] Neurologic manifestations are reported rarely & its severity in form of multiorgan failure are not documented as seen in our case No antidote available Serum & RBC cholinesterase levels remain within normal limits Diagnostic test to quantify is HPLC however it is not available. PAM is ineffective or contraindicated & might increase nicotinic effects (tachycardia, hypertension, muscle weakness) Plasma concentrations do not appear to be useful for guiding clinical management

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## Scoring system in Pancreatitis

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**Background:** Identification of patients at risk of severe disease & mortality in pts of acute pancreatitis is essential **t**o optimize management and to improve outcomes **Aim:** BISAP score as A simple method for early identification of mortality risk Present study to evaluate **"**Bedside index for severity in acute pancreatitis (BISAP)" score, a reliable source for predicting the severity and prognoses of acute pancreatitis (AP) BISAP score 3 (or ) >3 with any organ dysfunction or sepsis with in 72 hrs of admission predicts highest mortality rate Method: Medical record of 5 pts admitted with acute pancreatitis (with different etiology ) in our institution from January 2014 to October 2014 reviewed retrospectively, compared with BISAP score, APACHE-IIRANSONS criteria in tabular form .

**BISAP score**

| BISAP score on 24 hrs of admission | PT: 1 | PT: 2 | PT: 3 | PT: 4 | PT: 5 |
|---|---|---|---|---|---|
| Cause | GB calculi | GB calculi | Chronic alcoholic | Viral | Chronic alcoholic |
| BUN mg/dl | 38 (1) | 16 (0) | 38 (1) | 34 (1) | 30 (1) |
| Impaired mental status (or) GCS < 15 | No (0) | No (0) | No (0) | Yes (1) | No (0) |
| Evidence of SIRS | Yes (1) | Yes (1) | Yes (1) | Yes (1) | Yes (1) |
| Pt age >60 | 68yrs (1) | 39 (0) | 37 (0) | 24 (0) | 31 (0) |
| Imaging reveals pleural effusion | Yes (1) | No (0) | Yes (1) | No (0) | No (0) |
| BISAP score | 4 | 1 | 3 | 3 | 2 |
| Observations | | | | | |
| Recurrence of pancreatitis | No | No | Yes | No | No |
| Any organ dysfunction or sepsis on day 3 of admission | No | No | Yes<br>Liver dysfunction (+); AKI (+) | Yes<br>Liver dysfunction(+); penumonitis; Sepsis | No |
| Pt status | Planed for cholecystectomy<br>Discharge on request | Discharge | Expired | Expired | Discharge |

**INFERENCE:**

- **Prognosis of pt can be evaluated in short time of admission**
- **Cost saving**
- **BISAP Scoring on 24 hrs of admission with prolonged existence of organ failure for more than 72 hrs has high mortality rat**

**CRITERIA Comparison with APACHE II SCORE & RANSON'S**

**A. APACHE II score**

| APACHE II score | Pt 1 | Pt 2 | Pt 3 | Pt 4 | Pt 5 |
|---|---|---|---|---|---|
| Cause | Chr. Alcoholic | GB Calculi | Viral Pancreatitis | Chr. alcoholic | G.B calculi |
| Temp (centigrade) | 0 | 0 | 0 | 1 | 0 |
| MAP | 0 | 3 | 0 | 0 | 0 |
| HR | 0 | 1 | 0 | 2 | 0 |
| RR | 1 | 1 | 0 | 2 | 1 |
| PAo2 | 0 | 0 | 3 | 0 | 0 |
| Arterial PH | 0 | 0 | 1 | 2 | 0 |
| Sr. Sodium | 0 | 0 | 0 | 0 | 0 |
| Sr. Potassium | 0 | 0 | 0 | 3 | 0 |
| Sr. Creatinine | 1 | 1 | 1 | 1 | 1 |
| WBC | 1 | 1 | 0 | 0 | 0 |
| Hct | 1 | 1 | 2 | 3 | 0 |
| GCS | 0 | 0 | 0 | 0 | 0 |
| Score | 4 | 8 | 7 | 14 | 2 |
| Organ dysfunction after 73 hrs | No | No | Yes | Yes<br>Recurrent pancreatitis | no |
| | Discharge | Discharge | Expired | Expired | Discharge on request (planed cholecystectomy) |

**INFERENCE:**

- unable to predict mortality of patients .
- multi factorial –scoring system .
- time consuming

**B .RANSON'S criteria**

| At Admission | Pt 1 | Pt 2 | Pt 3 | Pt 4 | Pt 5 |
|---|---|---|---|---|---|
| Cause | Chr. alcoholic | GB calculi | Viral pancreatitis | Chr. alcoholic | GB calculi |
| Age (>55yrs) | 0 | 0 | 0 | 0 | 1 |
| WBC > 1600/cellsmm | 1 | 0 | 0 | 0 | 0 |
| BSL (>200 mg/dl) | 0 | 0 | 0 | 1 | 0 |
| Sr.AST (> 250 IU/L) | 0 | 0 | 0 | 1 | 1 |
| Sr.LDH(>350 IU/L) | 0 | 0 | 0 | 1 | 1 |
| After 48hrs of admission | | | | | |
| Sr calcium(<2 mmol/l) | 0 | 0 | 0 | 0 | 0 |
| Hct (fall by> 10%) | 1 | 0 | 0 | 0 | 0 |
| Po2 (<60 mmhg) | 0 | 0 | 1 | 0 | 0 |
| BUN (raise by 1.8 mg/dl | 0 | 1 | 0 | 0 | 0 |
| Base deficit (> 4 meq/L) | 0 | 0 | 0 | 0 | 0 |
| Sequestration of fluid >6 L | 0 | 1 | 1 | 1 | 1 |
| Score | 2 | 2 | 2 | 4 | 4 |
| Organ dysfunction | No | No | yes | Yes | no |
| | Discharge | Discharge | Expired | Expired | Discharge on request |

**INFERENCE:**

- **Have to rely on many tests & requires 48 hrs for prediction of outcome of patient**
- **Different criteria for alcoholic pancreatitis and GB calculi pancreatitis**

**Results:** BISAP score 3 (+) with any organ dysfunction or sepsis predicts the mortality or prognosis of patient, it is observed that elevated BUN is prominent marker for predicting outcome in pts **CONCLUSION:** BISAP SCORE is time saving & cost saving predictor, can be a most reliable source to analyze prognosis or predict mortality in pts presenting with acute pancreatitis. A prospective study is required to confirm our results and new methodology of evaluating BISAP score after 72 hrs of admission of acute pancreatitis pts who developed organ dysfunction or sepsis

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4 http://onlinelibrary.wiley.com/doi/10.1002/jhbp.118/abstract Comparison of the BISAP scores for predicting the severity of acute pancreatitis in Chinese patients according to the latest Atlanta classification Jia Zhang1, †, Muhammad Shahbaz2, †, Ruliang Fang2, Benjia Liang2, Chao Gao2, Huijie Gao2, Muhammad Ijaz3, Cheng Peng2, Ben Wang2, Zhengchuan Niu2and Jun Niu2, * Article first published online: 22 MAY 2014


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## A Prospective Study of critical incident reporting in an Indian Pediatric Intensive Care Unit


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**Introduction:** Critical incident represent a significant threat to patient safety leading its increased morbidity and mortality. Data on critical incidents from resource limited countries is scare. The objectives of our study were to describe the incidence and outcome of critical incident in PICU. **Methodology:** All children, 2 months - 12 years old, admitted in PICU from Jan - Dec 2013 were enrolled. All PICU staffs, including junior residents, senior residents, nurses, and physiotherapists were oriented before study begun. Critical incident could be reported by any of the doctors, nurses or parents in PICU on a predesigned proforma. Data collected included details of incident, its severity and effect on patients. Factors (human, equipment, environmental and practice related) contributing to critical incidents and complications due to incident were analyzed. We also identified the various strategies to prevent the critical incidents. Descriptive statistics were used to analyze demographic profile, investigations, complications, treatment and outcome (survived or died). Data was presented as mean (SD), median (IQR) and frequencies with percentages as appropriate. Critical event incidence was measured as per 100 patient days. Statistical analysis was done using SPSS 20. **Result:** Out of 789 admissions, 290 children (36.7%) had at least one incident with total reported incident being 449. Critical events incidence rate was 8.2/100 patient-days. Commonest incidents were related to medication (104, 23.2%), ventilation (89, 19.8%) and fluid and electrolytes (51, 11.3%). (108, 24.1%) incidents were insignificant and (160, 33.6%) were minor in severity. Only 1 incident was catastrophic due

to tube block resulted in death and (32, 7.1%) incidents were major in severity. Common complications reported were hypoxemia (55, 10.7%), signs of shock (51, 9.9%) and extravasation injury (36, 7%). (416, 92.7%) incidents were detected within 24 hours and human-factor (428, 56.5%) and practice-related-factors (297, 39.2%) were main reasons for incidents. Additional training (27.1%), greater awareness (22.4%), improve communication (17.3%), adherence to protocols (14.2%) were most commonly identified suggestions to prevent further critical incidents. **Conclusion:** Critical incident are not uncommon in PICU. Most of the factors were related to human and system errors and can be prevented. There is a need for continuous training of medical professional and adherence to protocols to decrease these incidents. The important limitation in our study is underreporting, especially minor events, because of lack of awareness. The reporting by nurses is very less due to lower levels of motivation and fear of punishment. Another limitation is voluntary reporting, as previous studies have shown that voluntary reporting underestimates the actual event.

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## Electrolytes from the blood gas analyzer – Are they comparable to serum electrolytes from the lab?

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**Introduction:** When dealing with very sick patients, the speed and accuracy of test results to detect metabolic derangements is crucial. Generally, it is much quicker to obtain arterial blood gas (ABG) report than lab tests. We evaluated if there was agreement between electrolytes obtained from blood gas analyzer and serum electrolytes measured using indirect ion-selective electrodes (dry chemistry). **Methods:** In this retrospective study, electrolytes were analyzed in 100 samples drawn from critically ill patients. Whole blood electrolytes were analyzed using OPTICA blood gas analyzer and serum electrolytes were analyzed in the central laboratory using ion selective electrode reflectometry method. Turnaround time for ABG is 10min and for the lab tests is one hour. The samples were drawn within 24hours from the time of admission. Agreement was summarized by the correlation and the 95% limits of agreement (LOA). **Results:** Correlation between sodium, potassium and bicarbonate measured by ABG and lab test was significant (R=0.8). When ABG measured sodium ($Na^+$) was < 137 (lower limit of our lab $Na^+$; n= 86), in only 50% of the serum samples, this was reflected. However, when ABG measured Na was ≤ 125 mmol/L, 73.3% of lab samples showed the same. When ABG potassium ($K^+$) > 5.1 (n=9), all the serum $K^+$ reports reflected this. However, 3 samples also showed hyperkalaemia on lab testing, when ABG $K^+$ was < 5.1. 95% limits of agreement (Bland Altman method) for $Na^+$ was wide from -13.2 to 3.49. **Discussion:** Time critical decisions are made in emergency based on point-of-care analyzers. In our samples, although correlation was significant, total reliance on ABG drawn samples would have overestimated hyponatraemia and missed 3 patients with significant hyperkalaemia. Clinicians should establish the correlation between ABG drawn electrolytes and serum levels in individual settings to optimize patient care.

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## Characterstics of critically ill patients who die early (<7days) in ICU: An observational study from a tertiary care centre of North India

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**Introduction:** Mortality is high in critically patients. Various scoring systems are available for mortality prediction. We conducted this study to identify patients who are likely to die early in a tertiary care referral ICU. **Objectives:** To study the characteristics of critically ill patients who die early (i.e. within 7days) of ICU admission. **Materials and Methods:** A retrospective cohort observational study conducted in a 12 bedded medical/surgical ICU of a tertiary care centre of North India. Data was collected for all adults from June 2012 to September 2014 who died during their stay in ICU (non-survivors). Hundred thirty two consecutive critically ill non-survivors were identified. Patients' characteristics, diagnosis, organ failure, APACHE II and SOFA at admission, day of mortality from ICU admission were noted. High APACHE II was defined as a score of >20 .High SOFA was defined as score > 9.The patients were divided into two group i.e. early mortality <7 days and late mortality > 7days. Statistical tests included Chi-square and student's t test. **Results:** Mean age of the study population was 49.6 ± 17.7 and sex ratio (M/F) was 84/49. Median admission APACHE II was 20 (range 6 - 42) and SOFA was 11 (range 4-19). There were 54 patients in group 1 (early mortality) and 78 patients in group 2 (late mortality). The mean duration of ICU stay in group 1 was 4.4 ± 1.7 days and group 2 was 23.6 ± 17.3 days. Among the various demographic factors and ICU severity scores studied between the two groups, high APACHE II, high SOFA and coagulopathy with bleeding at admission were predictors of early mortality ($p< 0.05$). **Conclusions:** High APACHE II (score >20), high SOFA (score >9) and coagulopathy with bleeding at admission can help in identifying patients who are likely to die within 7days of ICU admission. Further multicentre studies are needed.

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## Targetting 100% survival in toxicology cases

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**Introduction:** globally more than three million of acute poisoning cases with 2, 20, 000 deaths occur annually. It has been estimated that, in India five to six persons per lakh of population die due to acute poisoning every year, Poisoning is the fourth common cause of mortality in India. According to various studies organophosphate forms the commonest poisoning agent. Mortality rate in toxicology cases varies from agent to agent also from center to center. We conducted a prospective study from February 2013 to November 2014, in total number of 93 poisoning cases due to different agents, and collected the data to analyze the survival rate at a tertiary care center. **Methods:** we conducted a prospective data collection from February 2013 to November 2014, of poisoning patients, dividing them in the organophosphate, snake bite, alluminium phosphide (Celphos), and poisonous bite other than snake, kerosene, acid ingestion, unknown poisons and miscellaneous category. Demographic data, clinical and outcome data collected and analyzed. Change in the therapy was done to target increased survival required category. **Results:** most common poison agent in our tertiary center was organophosphates with 38 numbers of cases, all of them survived. Snake bite, rat poison, acid ingestion, kerosene and miscellaneous (nitrobenzene, turpentine oil, phenol) cases also saved with 100% survival. Survival in Celphos was 85.71% after initiation of new protocol with aggressive management of metabolic acidosis and early initiation of renal replacement therapy. **Discussion:** for targeting the 100% survival in poisoning cases, protocol guide approach gives the better results, for example in aluminum phosphide very aggressive management of metabolic acidosis, early institution of HD/CRRT/SLED, massive bicarbonate therapy for control of acidosis. In organophosphate apart from decontamination, important role of mechanical ventilation in cases with muscle weakness and intermediate syndrome, PAM in non carbamates. For snake bite cases, ASV and Early identification

and management of complication like intracranial hemorrhage coagulopathy, necrosis. These are the pillars for saving toxicology cases.

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## *In-Vitro* susceptibility of carbapenems against eskape organisms: A pan-India report

**Presenting author:** Dr Pradip Gore
**Co-author:** Dr Ruchika Bagga, Dr Beena Hemant, Dr Pooja Bhalgat, Dr Chetan Mehndiratta

**ABSTRACT: Introduction** Drug resistance is a growing concern amongst infection causing pathogens. Drug resistant microorganisms have resulted from unnecessary, indiscriminate or incorrect prescription, incorrect dosage and course duration of the prescribed drugs. Infectious Disease Society of America (IDSA) has highlighted some important antibiotic resistant bacteria: Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumanii, Pseudomonas aeruginosa, and Enterobacter species. These pathogens are acronomically called as "ESKAPE" pathogens. They are the causative organisms for majority of hospital infections and symbolize their "escape" from the effects of antibacterial drugs. The carbapenems are a class of β-Lactam antibiotics which have a broad spectrum of antibacterial activity. Doripenem, morepemen and imipenem are three carbapenemes currently in use for management of microbial infections. Doripenem is a synthetic, 1-β-methyl carbapenem administered through parenteral route with broad activity against gram-positive and gram-negative aerobic pathogens. Doripenem has a broad spectrum of activity against Gram-negative bacteria, similar to that of meropenem, while retain the spectrum of imipenem against Gram-positive pathogens. The main objective of this study was to evaluate the MICs of carbapenem derivatives, doripenem, meropenem and imipenem and estimate their susceptibility patterns for the ESKAPE organisms. **Methods** The study was a multi-centre, pan-India, in-vitro study of 3 months duration. A total of 100 isolates of ESKAPE organisms were randomly selected from ICU patients at the four major Zone of India. Isolates were collected from endo-tracheal tube aspirate, pus, sputum, urine, drain fluid, blood, tissue and pleural fluid. Most organisms had been identified at the time of isolation using the VITEK system. Bacterial susceptibilities were determined through Epsilometer test (E-test), based on the agar diffusion- technology for the quantitative determination of bacterial susceptibilities for drugs, after 24 hours of incubation of drug diffused E-strip on organism culture, strip gives a reading for the MIC of the drug. Test was performed with a maximum of five strips per agar plate and standard control strains were also put for analysis. The MIC's thus obtained were interpreted as falling into the susceptible (S), intermediate (I) or resistant (R) categories as per The Clinical and Laboratory Standards Institute (CLSI) and European Committee on Antimicrobial Susceptibility Testing (EUCAST) guidelines **Results** Highest susceptibility of 96% sensitive strains was seen with doripenem in 23 isolates of P. aeruginosa. Meropenem showed sensitivity to 70% strains with 13 % intermediate and Imipenem reported 65 % sensitivity to P.aeruginosa. Only 4% of P. aeruginosa strains have shown resistant with doripenem, compared to 30% resistance with imipenem and 17% with meropenem. Around 82% of K. pneumonia strains were sensitive to doripenem, 68% to meropenem and 36% to imipenem. A high resistant rate of 50% recorded with K. pneumonia for imipenem. Acinetobacter baumannii strains showed lesser sensitivity, with almost 80% resistant strains to all the three carbapenems. In Enterobacter spp. strains 100% were susceptible to doripenem while meropenem showed susceptibility to 67% strains and 58% strains were sensitive to imipenem. Resistance was seen with meropenem in 17% strains and imipenem reported resistance in 25% Enterobacter spp strains. The findings for the carbapenam sensitivity profile were, there was a good response to P. aeruginosa in all the four regions with almost 100% strains sensitive to doripenem. A similar response was seen in Enterobacter spp. isolates with doripenem in all the 4 centres. The analysis showed > 80% susceptibility to K. peumoniae with doripenem in south and east zones, while west and north zone reported some resistance to these strains. In west and south zone, S. aureus strains were more sensitive to doripenem (100%). There was a trend of developing resistance against carbapenems in the A. baumanni isolates in all the 4 zones. This was a serious cause of concern but as the number of isolates was very small, a larger duty with more number of isolates is required to confirm this. **Discussion** Earlier published reports have shown that the MIC of Doripenem for all enteric rods (E. coli, Enterobacter spp., and Klebsiella spp.) were ≤0.25 µg/ml and were recorded as ≤0.125 µg/ml for methicillin-susceptible S. aureus and all streptococci. Present study also supports lower MIC values of doripenem towards these pathogens. In the COMPACT Asia-Pacific study 2010 conducted in eight countries against 1612 isolates of P. aeruginosa, doripenem was found to be the most active of the three carbapenems *in vitro*. In another study doripenem was found to be four times more active than imipenem and twice as active as meropenem against P. aeruginosa with MIC90, 2µg/ml. The current study also observed a superior susceptibility of above 95% by doripenem. This study has shown the better effectiveness of doripenem as compared to the other two carbapenems, imipenem and meropenem, against hospital acquired infection. This was evident by lower MIC and higher sensitivity against microbial strains. To conclude, doripenem exhibits potency and/or spectrum advantages compared with both imipenem and meropenem against both Gram- negative and Gram-positive pathogens in the study.

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## Effectivess and safety of intravenous colistimethate sodium in the real world setting

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**Introduction:** The emergence of multi-drug resistant (MDR) gram negative organisms has led to the frequent use of colistimethate sodium (CMS), an antibacterial first available for clinical use in 1959 but disliked due to concerns of renal and neuromuscular toxicity. However, consensus on the most effective way to administer colistin, an active component of CMS has not yet been reached and none from India. The recent PK/PD data recommends the aggressive; weight and creatinine based dosing with an initial loading dose for colistin therapy. The objective of this study was to determine the safety, tolerability and efficacy of CMS in real world settings.**Methods:** This was a prospective, observational study of patients who were treated with CMS based on the treating physician's assessment. CMS was dosed using a loading dose of 9 Million International Units (MIU), followed by a maintenance dose, titrated based on renal function. For each CMS course, clinical response, bacteriological outcome, clinically significant changes in the vital signs and adverse events were recorded. In this interim analysis, results of 48 patients on CMS treatment is reported. **Results:** Mean age was 54±17.87 years [28 (58.33%) males]. The mean maintenance dose of CMS was 6.82±2.11 (range 2.5 to 11.08) MIU and mean treatment duration was for 10±3.36 (range 4 to 20) days. The mean duration of hospital stay was 23±11.95 days. Of the 48 patients, 34 (70.83%) patients were ICU admissions with mean Acute Physiology and Chronic Health Evaluation score of 17.88±7.80. Majority of the patients had no history of antibiotic use, pre-existing renal disease or treatment with any nephrotoxic or neurotoxic drugs. 47 (97.92%) patients showed clinical response (cure + improvement) at the end of the treatment period. 32 (66.67%) patients showed bacterial eradication at the end of treatment period. 11 (22.92%) deaths were reported where septic shock was the most common reason (10 patients) and none of these deaths were related to the study drug. **Discussion:** In this study, the loading dose followed by a maintenance regime of CMS was safe and efficacious without significant renal toxicity. Further results from the study are awaited.

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## Effect of oxygen injection sites on fraction of delivered oxygen ($FDO_2$) during noninvasive ventilation – An experimental lung model study

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**ABSTRACT: Introduction:** The two-level noninvasive positive pressure ventilation (NPPV) is the most commonly used mode of ventilation in the treatment of early respiratory failure. During NPPV, the inspired oxygen fraction ($FiO_2$) could be influenced by various factors such as the inspiratory positive airway pressure (IPAP), the expiratory positive airway pressure (EPAP), the $O_2$ flow rate and the site where $O_2$ is added to the circuit. **Aim:** To investigate the effect of IPAP, EPAP, $O_2$ flow rate, leak and the $O_2$ injection sites on the fraction of delivered oxygen ($FDO_2$). **Methodology:** A lung model was constructed to simulate noninvasive ventilation with bilevel positive airway pressure (BiPAP) without leak and with 10% leak; the oxygen analyser was placed proximal to the ventilator to measure $FDO_2$ when oxygen was injected at three different sites. The portable BIPAP device was set to spontaneous/timed mode. Inspiratory and expiratory pressures of the BIPAP device were set at 10/5, 15/5, 15/10 and 20/10 cm $H_2O$. **Results:** This study revealed that there is a variation in the $FDO_2$ with a change in the position of connection of oxygen tubing, leak in the system and the oxygen flow rate. **Conclusion:** During NPPV, the $FDO_2$ varies significantly with $O_2$ flow rate and presence of leak. Higher $O_2$ flow rates and lower amounts of leak provide a higher $FDO_2$. Higher $FDO_2$ is achieved if the oxygen tubing is connected proximal to the patient whereas the effect of ventilator settings on $FDO_2$ is not significant. We studied only 1 BiPAP machine, we suspect that the results would be similar with other commercially available bi-level ventilators.

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## The fallen lung: A case of persistent pneumothorax

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**Introduction**: Bronchial transection should be considered a finite possibility in cases of progressive pneumothorax refractory to closed underwater seal drainage. The 'Fallen Lung Sign" which is indicative of complete Bronchial rupture is usually elusive unless one looks for it. **Case report:** A 37 years old male presented to our hospital ER with a history of having been hit at the back by some heavy machinery while working at an industrial unit . He had a chest X Ray done which showed a pneumothorax with multiple rib fractures of the right side. An ICWSD tube was immediately placed on the right side . As he continued to be hypoxaemic he was shifted to the ICU for observation. A chest X Ray was done to confirm tube position which revealed that the pneumothorax was persisting with the ICD in situ. A second chest tube was inserted directed cranially . Initially there was a gush of air and the water seal bag got distended, thereafter persistent bubbling was noticed along with movement of the water seal bag with respiration. The chest drain had good respiratory swings. This prompted us to suspect a bronchopleural fistula and a CT of the chest was done. CT revealed that the lung had not expanded inspite of the chest tube being within the pleural cavity. In consultation with the cardiothoracic surgeon a low pressure suction (20mm Hg) was attached to the chest drain assembly, which gave the patient transient relief. Over the next six hours the patient became extremely hypoxaemic and was intubated and placed on mechanical ventilation. Large air leaks occured and inspite of high $FiO_2$ his $SpO_2$ was around 88 %. With a strong suspicion of transection of the main bronchus a bronchoscopy was done. The bronchoscope could not be negotiated at all in the right side. All that could be seen was irregular structures suggestive of the mediastinum. He was immediately taken up for surgical repair. The ETT was changed to a DLT and right posterior lateral thoracotomy was done in left lateral position through 5th ICS . The Right lung was completely collapsed with the right main stem completed transected about 1 cm distal to the carina. The cut ends of the bronchus was refashioned and end to end anastomosis was done. Two chest drains were given and the wound closed in layers. He was shifted to the ICU and ventilated overnight . The chest X ray subsequently revealed a well expanded lung on the right side. The patient was extubated and placed on BiPAP. Post operative course was uneventful. Regular chest physiotherapy was done. The patient was shifted to ward from where he was discharged 12 days post operatively. **DISCUSSION:** Tracheobronchial Injury is an uncommon life threatening injury, being found in only 0.5-2% of all blunt chest injuries. The usual site is within 2cm from carina; the right main bronchus injury is more common than the left or the trachea. The site of airway rupture primarily determines radiographic findings. Injuries to the bronchi occur due to rapid deceleration and shearing of mobile lung and bronchi from relatively fixed proximal structures. The chest radiograph is the standard initial screening test however the radiographic manifestations are usually nonspecific and includes pneumomediatinum, pneumothorax, and subcutaneous emphysema. The "Fallen Lung Sign" is specific for complete bronchial transection[3]. This sign describes the lung falling dependantly, rather than collapsing centrally towards the hilum in the presence of a pneumothorax. CT Scan chest confirms the tracheobronchial injury. Fibreoptic Bronchoscopy is the best diagnostic tool for determining the location and extent of airway injury. A persistent pneumothorax after a well placed chest tube insertion should arouse the suspicion of a tracheobronchial rupture. for adequate repair and pulmonary preservation surgery should be performed within 48 hours, delayed surgery carries a high risk of stricture formation and infection. In our case the diagnosis made on clinical suspicion was confirmed by Bronchoscopy and CT Scan chest.

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## Clinical outcome of magnesium replacement in hypomagnesemic critically ill patients

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**Abstract Introduction**: Epidemiologic studies showed that there is an increased morbidity and mortality rate in hypomagnesemic critically ill patients. The aim of this study is to determine if magnesium replacement in hypomagnesemic critically ill patients has an effect on the morbidity and mortality as to length of hospital and intensive care unit stay, mechanical ventilation duration and mortality rate. **Methods**: There are 112 patients admitted at intensive care unit from November 2013 to October 2014, a total of 101 subjects were included in the study. This study is a prospective cohort. Serum Magnesium levels is determined. Magnesium replacement (250 mg of magnesium via slow IV push or 400 mg PO) is given to patients with low magnesium levels. Correction is continuously done until serum magnesium levels are tested within 24 to 72 hrs to reached a normal range of 0.7 - 1 mmol/L. Descriptive statistics were generated for all variables. For nominal data, frequencies & percentages were computed. For numerical data, mean ± SD were generated. Analysis of the different variables was done using the following: ANOVA, Kruskal Wallis test, T-test and Chi-square test. **Results**: The serum magnesium level was measured upon admission. 39.6% of patients had hypomagnesemia and 60.3% had normomagnesemia. There were no significant difference in mortality rate (27.5% vs 32.8%, p=0.57), length of intensive care unit stay (3.05±2.31 vs. 2.84±1.83, p=0.83), length of hospital stay (6.88±3.98 vs. 8.18±6.45, p=0.63), and mechanical ventilation duration (0.73±1.15 vs. 1.57±3.63, p=0.48) between adequately replaced magnesium to hypomagnesemic patients and normomagnesemic patients. In a subgroup analysis of patients

with sepsis, there was a shorter hospital stay among adequately replaced magnesium to hypomagnesemic patients compared to normomagnesemic patients (4.44+2.56 vs. 10.13+7.25) and its difference was statistically significant (p value of 0.01). **Discussion**: The study showed that upon magnesium replacement, clinical outcome becomes similar to those with normal magnesium levels at the onset. There is no difference in length of intensive care unit and hospital stay, mechanical ventilation duration and mortality rate among critically ill patients with hypomagnesemia who recieved magnesium replacement compared to those with normal magnesium levels. A trend towards a shorter number of hospital stay, mechanical ventilation duration and mortality rate upon magnesium replacement was seen. Furthermore, there is a statistically significant decrease in length of hospital stay among hypomagnesemic septic patient who received magnesium replacement.

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## Study the role of Ulinastatin as an adjuvant therapy in patients diagnosed with severe sepsis of varied aetiology

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**Introduction**: Response to sepsis and to adjuvant modalities in treatment shows variations across genomic groups. There has not been any major study from India on the response to Ulinastatin in adult patients with severe sepsis. Our objective was to study the role of Ulinastatin as an adjuvant treatment in severe sepsis of varied aetiology. **Methods:** This was an observational study performed from August 2013-August 2014 at a 24 bedded ICU of a multi specialty hospital with patients diagnosed with severe sepsis of varied etiology. The primary objective was to assess the impact on outcome with Ulinastatin in severely septic ICU patients. **Primary end point:** 28 day all-cause mortality **Secondary end points:** Hemodynamics optimization and shock reversal Acute kidney injury P/F ratio To evaluate which patients, on the basis of the etiology and disease stage could benefit the most from the therapy. **Results:** 20 patients with severe sepsis of varied etiology like abdominal, thoracic, urinary and soft tissue infections enrolled over 2 years. Intravenous administration of Ulinastatin (200, 000 IU) 12 hourly was delivered on five consecutive days. 100 patients received Ulinastatin in addition to the conventional therapy, whereas the other 120 patients (control group) were treated only with conventional therapy.28 day all-cause mortality was 20% in patients treated with Ulinastatin compared to 35% in controls which did not receive any immune therapy. New onset organ failure decreased from 33.33% in the control group to 24% in the Ulinastatin group. The improvement of hemodynamics and time to stoppage of vasopressors was comparable in the two treatment groups. There was a statistically significant reduction in average length of hospital stay in survivors from 24.51±6.25 days in placebo group to 18.43 ±5.54 days in the Ulinastatin group.Patients in whom ulinastatin therapy was instituted early(within 24 hours) had better outcome then those where therapy was instituted after 24 hours. **Discussion:** Ulinastatin effectively reduced mortality in patients with severe sepsis when used as an adjuvant therapy in addition to standard sepsis care. The reduction in mortality was accompanied by a shorter stay in the hospital and a shorter duration of ventilator and vasopressor dependency.

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## To assess the usefulness of double lumen catheter for drainage of pleural effusions of varying etiology

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**Introduction:** The objective of the present study was to evaluate the use of a double lumen 7 fr central venous catheter for the drainage of pleural effusions in intensive care unit/admitted patients. **Methods:** All the patients with pleural effusions who required drainage were subjected to this method after taking written consent. Total procedures done: 30. This procedure was used in all types of conditions resulting in pleural effusion i.e. Heart failure, post cardio-thoracic surgeries, parapneumonic effusions, chylothorax, empyema, etc. **Result:** Patients had immediate improvement in their respiratory distress, tolerated the procedure well as it is less painful and needed less sedation and analgesia. There were no instances of pneumothorax, hemothorax, re-expansion pulmonary edema and catheter blockage/ disconnections. **Discussions:** The main advantage of this technique was to effectively manage patients who require inter costal drainage of pleural fluid by using an easy to perform procedure while being equally advantageous, less painful and with fewer complications. It is very useful to access loculated effusions in all areas of the pleural space. In ICU ventilated patients who had bilateral moderate to severe pleural effusions due to hypoproteinemia, heart failure, with weaning difficulty, pleural tapping with this method had helped to wean them off ventilator early.

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## Audit on intrahospital transport of ICU patients in a tertiary care cancer hospital

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**Introduction** The transport of critically ill patients to procedures or tests outside the ICU is potentially hazardous; hence the transport process must be organized and efficient. We have done audit on intrahospital transport of adult critically ill patients in our tertiary care cancer centre over a period of 6 months. **Methods** 120 critically ill patients transported from the ICU for either diagnostic or therapeutic procedure over a period of 6 months were included. The data collected includes, mode of transport (on transport trolley or with the patient's bed), where they transported, the accompanying person(Junior or Senior resident, JR or SR), total time spent outside the ICU and any adverse events in relation to the above said parameters were noted. **Results** 120 critically ill adult patients underwent intrahospital transport, among which 83(69.16%) pts shifted on transport trolley and 37(30.83%) pts shifted with bed. 26.7% patients were accompanied by 2$^{nd}$ year JR, 22.5% by the 3$^{rd}$ year JR, 47(39.2%) by 1$^{st}$ year SR and 11.7% patients by 2$^{nd}$ year SR. During the transport 5(4.1%) patients required endotracheal intubation, 5(4.1%) patients required intercostal drain placement in view of pneumothorax. 24(24.1%) patients required new intravenous line placement in view of accidental removel, 20 (27.5%) patients required cardiopulmonary resuscitation. 4(3.3%), 4(3.3%), 2(1.6%), 4(3.3%) patients had severe bradycardia, significant tachycardia, severe hypotension and severe hypoxia respectively, there was no difference between the mode of transport (trolley vs with bed) in the adverse change in vitals (P>0.05). Central venous catheter came out in 2(3.9%) patients, drain came out in 3(6.6%) patients, ryles tube came out in 1(1.2%) patient. 2(2.7%) patients got self extubated and in one patient tracheostomy tube came out accidentally. The adverse events were more in patients who spent more than 60 minutes outside the ICU particularly requirement of CPCR (2(1.6%) vs 31(25.8%), <60min vs >60min respectively) with P<0.05. Transport helps in change in therapy in the form of putting a pigtail for the collection, surgical reexploration and angioembolisation etc in about 32(26.7%) patients. **Discussion and conclusion** Transport should occur when the benefits to the patient exceed the risks, diagnostic test or procedure expected to alter management, it does not compromise the patient's outcome, patient need the services that exceed the available resources of a facility.

Our audit shows that intrahospital transport and imaging led to change in therapy, though the transport often led to hazardous changes in vital parameters. No difference in change in vital parameters whether the pts shifted on either trolley or with bed, significant adverse events known to occur during intra-hospital transport, and the adverse events were more in pts who spent more time outside the ICU. The adverse events were more in patients who are accompanied by the first year senior resident, probably because they shifted the more sicker patients and were newer to the institute as they just joined the institute.

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## Hurdles in implementing therapeutic hypothermia in patients post cardio pulmonary resuscitation

**Presenting author:** Dr. Siddhesh D. Rajadhyax
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**Aims and objectives:** Induction of therapeutic hypothermia is well established but target temperature is debated. (32-34C v/s 36C). In absence of modern devices( Arctic Sun, Cincinnati pads, IVC catheter etc.), in resource limited settings multiple hurdles/ difficulties are faced. We hereby highlight the difficulties in 4 consecutive patients, where we induced therapeutic hypothermia and suggested solutions for the same. **Methodology:** Therapeutic hypothermia protocol followed in Post Cardiac Arrest patients at Sunshine Global Hospital, Surat. If patient remains unresponsive after successful cardio pulmonary resuscitation and return of spontaneous circulation(ROSC), therapeutic hypothermia is induced after ruling out all the contraindications for the same. Core body temperature by rectal temperature probe is measured and targetted at 32 to 35 C Tranfusion of cold saline intravenously [ 1-2 lit bolus] to induce hypothermia. Covering the patient with wet towels and use of blower and/ or fan for surface cooling. Application of ice packs to the patient's head, neck, axilla, chest, abdomen and limbs. Above steps are regulated with aim at induction and maintainance of rectal temperature at 32 to 35 C for 12 to 24 hrs post cardiac arrest Hurdles faced and managed during induction and maintainance of hypothermia studied using the example of 4 patients treated with therapeutic hypothermia. **Results:** In a patient, the target temperature for therapeutic hypothermia (34C) was over shooted (31.2C) and in 2 patients hypokalemia and in 3 patients hypovolaemia developed on lowering the temeprature . In one patient bradycardia noted which was clinically significant. Steps at mitigating the hurdles are discussed in the poster in our resource limited setting.

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## Prognostic importance of *Serum Procalcitonin* and *Amino-Terminal Pro-Brain Natriuretic Peptide* levels as compared to *apache-IV* on ICU admission, in a mixed Intensive Care Unit Population

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**Abstract Introduction**: Timely and early decision making is very essential to improve the outcome of critically sick patients. Conventionally used prognostic scores like APACHE IV are quite cumbersome. Various biomarkers like procalcitonin and NT-proBNP are becoming popular in daily ICU practice. Procalcitonin and NTproBNP have been found to have prognostic value in various conditions separately. We chose to study the prognostic utility of these markers at ICU admission as compared to APACHE-IV **Materials and Methods**: It was a retrospective cohort study. Randomly selected cohort of 100 eligible patients whose PCT and NTproBNP measurements had been done on ICU admission was analysed. Correlation between the procalcitonin, NtproBNP and APACHE- IV score with all cause mortality, length of hospital stay, need of ventilatory support, need for vasopressors was done. **Results**: Among the total of 100 selected ICU patients, 28 were non-survivors. NTproBNP ( AUC 0.649; P value 0.021) was found to be an independent predictor of mortality comparable to APACHE-IV ( AUC 0.643; P value 0.027). NTproBNP was better than PCT and APACHE-IV for predicting need for ventilation and / or inotropes during ICU stay (AUC 0.763, 0.711, 0.706 and p values 0.000, 0.002, 0.003 respectively). PCT was found to predict prolonged Hospital stay ( LOS>15 days, AUC 0.616, Pvalue 0.045). **Conclusion:** The current study demonstrated a good predictive value of NTproBNP, comparable to APACHE-IV in terms of mortality and morbidity. Procalcitonin, however, was found to have doubtful prognostic importance. These findings, however, need to be confirmed in a prospective larger study. **Key points:** Procalcitonin, NTproBNP, On admission, Prognostic, mortality, morbidity, ICU

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## Incidence and risk factors of thrombocytopenia in intensive care units of a tertiary hospital in North India

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**Background**: - Thrombocytopenia is a common hematological abnormality in ICU. Its incidence has been found to be 13% to 44% worldwide, mainly western figures. We chose to study the incidence, risk factors and impact on transfusion requirements of thrombocytopenia in a tertiary care ICU of North India. **Methods**:- It was a prospective observational cohort study involving two 22 bedded mixed medical -surgical Intensive care units .All Ethics Committee approvals were obtained prior to the start of the study, All consecutive admitted patients in medical surgical ICU for at least 2 days and 18 years or older with six month period were included. All patients with history of recent cardiac surgery, pregnancy, platelet disorders, hematological malignancies, recent chemotherapy were excluded. **Results**: - Out of 500 patients, 41 patients had thrombocytopenia on admission. Out of the remaining 459 patients, 149 patients developed new onset thrombocytopenia (NOT) during ICU stay. The incidence was 29.8%.The prevalence was 38%.ICU mortality was 13%.Thrombocytopenia was commonly found to be due to sepsis with disseminated intravascular coagulation, drugs like carbapenem, cephalosporin, fluroquinoles, glycopeptides.etc, other causes was heparin induced thrombocytopenia. Causes could not be established in 10 patients. Underlying coronary artery disease ans sepsis correlated with thrombocytopenia. Mortality was higher in patients with new onset thrombocytopenia (15.4% vs 8.7%, P=.003) .Patients with new onset thrombocytopenia requires more blood transfusion. Majority of cases being prophylactic. Patients with NOT requires mechanical ventilation and inotropes frequently as compared to non thrombocytopenic patients (57.7 vs 38.4, P=.000, 23.5 vs 13.5, P=.008).There was no difference in terms of Length of hospital stay, bleeding risks among the two groups. **Discussion and Limitation**:-Our study showed incidence and prevalence of thrombocytopenia in ICU comparable to the internationally reported figures. NOT was found to be associated with higher mortality. Major strengths of the study were adequate sample size and prospective nature. However the evaluation of thrombocytopenia could have been better. The findings of the study may not be a true representation of the country as it was conducted in a single tertiary care centre. **Conclusion:-**Thrombocytopenia

is common in medical surgical intensive care units. New onset thrombocytopenia is associated with higher mortality and morbidity in the intensive care units. It probably can be considered as a marker of disease severity. **Key Words:-**Thrombcytopenia, Medical surgical ICU, risk factors, mortality, morbidity.

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## Unplanned extubations: Experience in a Mixed (Surgical and Medical) ICU

**Presenting author:** Dr Somnath Chatterjee
**Co-author:** Dr Faheem Khan, Dr Harshal Andhare, Dela Pena Eleanor Gigawin

**Introduction:** Unplanned extubation is defined as a premature accidental or purposeful removal of the endotracheal tube by a patient. It is an undesirable event and associated with additional morbidity and mortality. The incidence rate varies between medical and surgical ICU`s and varies from 3% to 16% (1, 2). **Methods:** Retrospective analysis of mechanically ventilated patients in the Mixed Intensive Care Unit at Alexandra Hospital, Singapore from April, 2010 till Sept, 2014. **Results**: 783 patients were mechanically ventilated via orotracheal tube. Only 11 patients had an unplanned extubation with an incidence rate of **1.40%.** Majority of the patients were medical, 8 in number and 3 were surgical patients. The data analysed revealed average APACHE 2 score of 12 .Only 4 (36%) patients needed re-intubation with no difficulty ascertained during re-intubation. Only 1 patient needed Non Invasive ventilation and remaining 6 patients didn`t require any form of ventilation other than oxygen via face mask. In majority of the episodes, patient pulled out the endotracheal tube (8/11), 2 patients coughed out the tube and in one case, it was not documented. No serious untoward events were reported post unplanned extubation

| **Total patients intubated** | **783** |
|---|---|
| Unplanned extubated patients | 11 (1.4%) |
| Medical pts | 8/11 |
| Surgical pts | 3/11 |
| Average APACHE II score | 12 |
| Re-intubation episodes (patients) | 4/11 |
| Non invasive ventilation | 1/11 |
| No re intubation | 6/11 |
| Reasons for unplanned extubation | |
| Patient pulled out | 8/11 |
| Patient coughed out | 2/11 |
| No documentation | 1/11 |

**Conclusions:** The Intensive Care unit (ICU) in Alexandra Hospital, Singapore is the first mixed Medical and Surgical unit In Singapore. Data about unplanned extubation in literature is mostly from either medical or surgical ICUs. The experience of our mixed unit reveals an incidence rate of 1.4% of unplanned extubation. The practice in our unit is daily Consultant led ward rounds, reviewing daily sedation scoring and a multi-disciplinary approach (including physiotherapists, nurses and respiratory therapists) about the need to continue intubation and mechanical ventilation. . Physical restraint is used in patients suspect to be at high risk for unplanned extubation. Physical restraint is a measure which is taken seriously and is instituted after due diligence . It is recommended to have unplanned extubation rate of less than 1% in any type of Intensive care unit, as it is proven to increase morbidity and mortality of already sick patients. It can be achieved by a combination of factors as suggested above. It should ideally be one of the key performance indicators.

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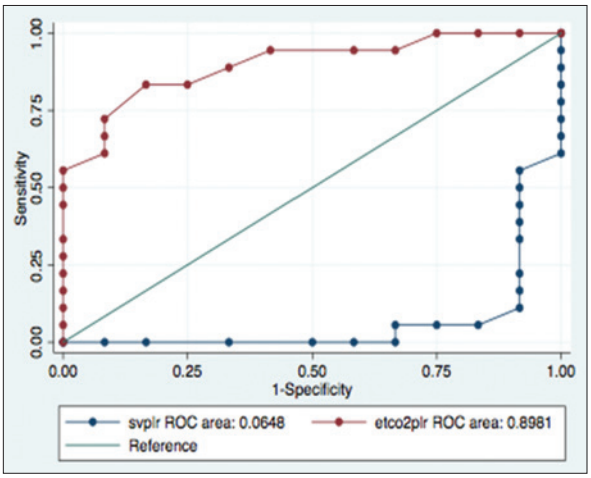
## End tidal carbon dioxide ($ETCO_2$) changes induced by passive leg raising (PLR) can predict volume responsiveness in mechanically ventilated patients

**Presenting author:** Dr Alai Taggu

**Introduction:** ETCO2 changes during PLR as a predictor of fluid responsiveness has not been extensively evaluated.ETCO2 changes correlate with cardiac output(CO) changes have been demonstrated. Considering PLR as a reversible volume expansion(VE), we tested the hypothesis that ETCO2 changes induced by PLR can predict fluid responsiveness in mechanically ventilated patients. **Methods:** A prospective observational study conducted on 30 mechanically ventilated patients eligible for fluid challenge as decided by the intensivist. Exclusion criteria were age<18years, pregnancy, intracranial hypertension, deep venous thrombosis, limb and pelvic fractures. Mainstream ETCO2 analyser and transthoracic echocardiography were used for ETCO2 and stroke volume(SV) estimations.Data collection done at baseline, during PLR and after VE.Patients were considered volume responders if the change in SV post VE was >15%.Hemodynamic parameters were simultaneously recorded.STATA12version was used for analysis. **Results:** Twenty out of 30 patients were responders. Post PLR systolic blood pressure(BP)-98.4±16.4 vs 116±21.2, P=0.02 and diastolicBP-46.5±11.4 vs 63.2±11.8, P=0.004 were notably significant. After PLR, SV increased by 14.6±11.6%(95%CI, 11.5–17.4%;P<0.0001) and ETCO2 increased by 5.34±3.04%(95%CI, 4.03–6.23%, P<0.0001).After VE, SVchange strongly correlated with the post PLR SV and ETCO2 change ($r^2$=0.63 and 0.58 respectively).




The reciever operating characteristic(ROC)curves with area under the curve(AUC) of PLR induced ETCO2 (etco2plr) and SV (svplr) changes for predicting the responsive were 0.89(0.75-0.92) and 0.94(0.84-0.99) respectively.The sensitivity and specificity of etco2plr at 5% threshold and svplr at 15% were 72%, 84% and 76%, 99.6% respectively.The main limitation of the study being small sample size. **CONCLUSION:** PLR induced ETCO2 changes reliably demonstrate volume responsiveness in mechanically ventilated patients and hence can be used as a predictive index.

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## Epidemiology of device associated nosocomial infections in one of tertiary care ICU of India

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***Co-author:*** Dr.Shreekant Champanerkar, Dr.Imraan Gafoor, Dr. Ruchi Gupta, Dr. Debashish Dhar, Dr.Dinesh Rawat, Dr.Ashok Anand, Dr.B.K.Rao.

**Introduction: -** Health care-associated infections from invasive medical devices in the intensive care unit (ICU) are a major threat to patient safety. Most published studies of ICU-acquired infections have come from industrialized western countries. But rates of Device associated nosocomial infections and bacterial resistance and their effect on mortality in developing countries is not being studied due to paucity of available data. **Methods: -** Retrospective cohort surveillance of device associated infections of patients admitted to Sir Gangaram Hospital ICU over duration of 18 months using CDC NNIS definitions.

**Results: -** During April 2013 to September 2014, 3343 patients were hospitalized in our ICU. Out of which there were 156 device-associated infections for an overall rate of 3.67 infections per 1000 Device days. Ventilator-associated pneumonia posed the greatest risk (48.07% of all device-associated infections or 5.89 cases per 1000 ventilator days), followed by Central line-associated bloodstream infections (39.10% of all device-associated infections or 4.99 cases per 1000 catheter days) and catheter-associated urinary tract infections (8.97% of all device-associated infections or 0.79cases per 1000 catheter days). Being a better surveillance marker, Central line associated-BSI rate (4.99 per 1000 catheter days) was more than Cather Related- BSI rate (0.49 per 1000 catheter days). Notably Gram-negative Enterobacteriaceae was most common causative pathogen (71.79% of all Device associated infections) followed by Gm-positive and Fungal pathogens. 97 % of these Gram-negative Enterobacteriaceae are ESBL producing organisms and 100% of Infections caused by Staphylococcus are Methicillin resistant strains. Crude mortality rate in these patients with Device associated infections was more than other patients. **Discussion: -** Device-associated infections in the ICUs of developing countries pose greater threats to patient safety. Active infection control programs that perform surveillance of infection and implement guidelines for prevention can improve patient safety and must become a priority in every country. These initial data are not adequate to represent entire country, and likely variations in the efficiency of surveillance and institutional resources may have affected the rates that were detected.

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## Acute febrile illness in adult Intensive Care Unit: The disease spectrum and outcome – An experience from a tertiary care hospital in North India

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**Introduction:** Acute febrile illnesses are a common cause of intensive care admission. The incidence and severity of tropical febrile illnesses are unclear. Local prevalence of individual diseases influences the prioritization of the differential diagnoses and treatment.

Aims and objectives:

- To find out etiology of AFI
- To find out reasons of ICU admission
- To find out predictors of mortality

**Materials and methods:** A one year prospective, observational study was conducted in adult intensive care unit of Sir Ganga ram hospital New Delhi. All adult patients admitted with acute febrile illness with at least one organ dysfunction were enrolled for the study. Acute febrile illness was defined as a febrile illness less than 7 days duration. SAPS ii criteria were taken for organ dysfunction. **Data collection**: Duration of data collection was one year. Following parameters documented:

- Clinical signs and symptoms
- Admission laboratory values of hemoglobin, hematocrit, platelet and leukocyte counts,
- Prothrombin time, blood urea, serum creatinine,
- Organ dysfunction score
- Microbiological and immunological parameters

**Results:** Out of 2264 total ICU admissions in this period, 120 (5.30%) patients suffered from Acute Febrile Illness (AFI). There were 72 males and 48 females with age ranging from 16 to 77 years, mean age being 38.3 years. 71 patients with AFI had Dengue fever (59.16%), 24 patients had Scrub typhus (20%), 11 patients had Malaria (9.16%).In 16 patients (13.33%) no definite diagnosis can be established. 5 patients had pneumonia, 3 patients had Meningitis, 2 patients had Typhoid fever & HEV induced hepatitis whereas 1 patient had AML. 17 patients had more than one laboratory marker. All the patients had evidence of severe sepsis. Most common reason for ICU admission was ventilatory support (77 patients) followed by Encephalopathy (55 patients), Shock (47 patients) & Bleeding (27 patients). Most common organ dysfunction was Pulmonary dysfunction (P: F <300) seen in 72 patients (60%) followed by Hepatic dysfunction in 67 patients (55.83%), Renal dysfunction in 56 patients (46.6%), and Cardiomyopathy in 10 patients (8.33%). 52 patients in the stuy group died during the course of the disease giving a moratlity rate of 43.33% and the most common cause of mortality was Dengue fever. Mortality rate in patients with AFIwas much higher compared to the total ICU mortality (31.4%) in the same period. Statistical Methods: SPSS 13.0 for windows will be used for statistical analysis. Data will be recorded on a pre-designed proforma. Before entering the data on the excel spreadsheet, the proforma was reviewed for incomplete information. Results will be expressed as mean and SD. One way analysis of variance (ANOVA) will be used for analyzing differences among groups. Chi square Test will be used for comparison of qualitative data. Statistical significance is defined as $p<0.05$.

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## Experience with percutaneous tracheostomy at an adult intensive care institute in northern India: A descriptive study

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**ABSTRACT Background:** Percutaneous dilatational tracheostomy (PDT) has gained popularity due to advantages it offers over surgical tracheostomy. Some questions regarding the patient selection, timing

and optimal method do not have conclusive answers yet. It is hoped that availability of more and more data on percutaneous tracheostomy can make us wiser in this aspect. **Objective:** To report the analysis of our experience with PDT in the Intensive Care Unit (ICU) in terms of reason for tracheostomy, use of bronchoscopy, duration of ventilation and complications **Method:** A retrospective analysis of 301 patients who underwent PDT in a multidisciplinary medical-surgical ICU between 2009 to 2012 was carried out. Data was computerized and analyzed for the reasons for PDT, total duration of ventilation, and duration of ventilation after tracheostomy, use of bronchoscopy, and complications if any.**Results:** Of the 301 patients analyzed 75.4% were men and mean age was 58.4 years. Reasons for tracheostomy were found to be - airway protection (16.9%), prolonged ventilator support (12.6%), difficult weaning (5.3%), secretion clearance (6.6%) . Majority of patients (58.6%) however had more than one reason for undergoing tracheostomy.Bronchoscopy was used in 42.5% of cases. The mean total duration of ventilation in subjects with chronic respiratory disorder and group not having chronic disorder was found to be 21.3 days and 17.5 days respectively (p =0.000) The mean total duration of ventilation after tracheostomy in each of the above groups was found to be 10.4 days and 8.3 days respectively (p=0.003). Overall, 30 subjects were found to have some complication. Among the complications 0.3%were intraoperative major complications (bradycardia) ; 7% were intraoperative minor complications (transient bronchospasm, local bleeding, desaturation during procedure, endotracheal tube cuff puncture), and 3% were immediate postoperative complications ( bronchospasm requiring continuous bronchodilator nebulizations, post procedure subcutaneous emphysema, deterioration of respiratory parameters within 8 hours of the procedure - probably reflecting worsening of underlying disease) . Bleeding as a complication occurred in 4.6% patients (14 cases of intraoperative local bleeding requiring transient interruption only). There was no episode of excessive bleeding requiring surgical intervention or blood transfusion. **Conclusions:** Bedside PDT is a simple, safe and readily available procedure associated with low morbidity if performed by an experienced operator after thoughtful patient selection. **Key Words:** Percutaneous dilatational tracheostomy, ICU

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## Catheter directed thrombolysis: A newer modality of treatment for extensive proximal deep vein thrombosis

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We present two case reports of acute proximal DVT, successfully treated by catheter directed thrombolysis using a set protocol. **Case 1:** 34 years old vegan male, presented with acute pain and swelling of right lower limb including right inguinal region of 2 days duration. Venous Doppler of right lower limb showed DVT involving popliteal vein, SFV, CFV, EIV, CIV, extending into infrarenal IVC. Blood investigations revealed: Vitamin B 12 deficiency and Hyperhomocysteinemia. **Case 2:** 72 years old lady hospitalized for lithium toxicity and being dialysed for the same; developed acute swelling of the right lower limb on third day of starting dialysis. Venous Doppler showed right lower limb DVT involving popliteal vein, EIV, CFV, SFV extending into iliac veins. **PROTOCOL:** Through 10 Fr right jugular access, Gunther Tulip optional filter was placed 1 cm below the lowest renal vein. Right popliteal vein accessed under USG guidance and venogram done showed partial thrombosis of SFV and CFV; and complete thrombosis of right iliac veins extending into IVC. Thrombus fragmentation done using 6Fr pig tail catheter followed by mechanical aspiration using 7Fr guiding catheter and 7 Fr long sheath. At the end of PSPMT, the SFV and CFV were completely opened up. But there was narrowing in iliac veins. Balloon angioplasty done for iliac veins by using 12*40 mm balloon. After balloon angioplasty a multihole infusion catheter placed in CFV till IVC and transcatheter thrombolysis done using Urokinase(2.5 lakh bolus followed by 1 lakh/hr for 12 hours) Continuous heparin infusion given through sheath 1000 u/hr for 12 hrs. Repeat venogram done after 12 hrs showed complete recanalization of SFV and CFV; and partial recanalization of left EIV and CIV. In one patient there was significant stenosis of left EIV and CIV, 14*60 mm self-expanding stent was put across the stenosis. Post stenting the vessel was completely opened up with free antegrade flow. Jugular and popliteal sheath removed when ACT is within normal limits. Followed by above procedure patients were maintained on low molecular weight heparin over lapped with warfarin. Both patients were shifted out of the ICU on day3 and discharged subsequently on day 5 of the procedure. **CONCLUSION:** Even though the initial cost of CDT is relatively high; it is found to reduce hospital stay and subsequent incidence of PTS (post thrombophlebitis syndrome)and early mobilization is possible. Thus this cost effective modality of treatment which results in decreased length of stay and morbidity must be explored in all patients of acute proximal deep vein thrombosis.

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## Successful management of a case of severe toxic epidermal necrolysis (TEN) (90%) with acinetobacter sepsis in a non burn ICU center

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**INTRODUCTION:**. Toxic epidermal necrolysis is an acute inflammatory skin reaction and is the most severe form of drug-induced skin reaction and includes denudation of >30% of total body surface area[1].The average reported mortality rate of TEN is 35-55%; it can be even higher in elderly patients and those with a large surface area of epidermal detachment.[2]. There is a significant associated mortality rate which is largely due to secondary infection and multi-organ dysfunction syndrome[3]. Carbamazepine, was found as the most common offending drug in India in this series[4] Discontinuation of the offending drug and prompt referral to a burn unit are generally agreed upon steps but specific management guidelines not available[5].Here we report a successful management of a severe case of TEN with 90 % involvement of skin complicated by secondary Acinetobacter infection in a makeshift ICU Room, as we did not have a separate Burns ICU. **CASE DESCRIPTION**. A 26 year old male with no co morbidities was admitted to a private hospital after he developed wounds in mouth and fluid filled lesions all over body. He was recently started on oxy carbamazepine for alcoholic withdrawal. As the skin lesions were increasing and patient started having fever he was referred to Lakeshore hospital for further care. He was admitted to MICU. Septic workup, Routine Blood investigations, HIV, HbsAg, HCV, VDRL and ANA sent all negative on admission. Rt femoral trple lumen catheter insertion done for iv access as the sampling and peripheral iv access was difficult. Skin examination revealed diffuse regions of skin sloughing with necrosis and a mildly erythematous base along the dermis; there were many bullae and vesicles. Over 60-70% of the patient's total body surface area (BSA) was involved on admission which later progressed to involve 90% of skin. The non-affected area of the patient's skin easily sloughed with lateral traction. The oral mucosa was injected and sloughing apparent. Cornea was spared. And on D2 patient was moved out of ICU to a separate isolation room with monitor and ICU nurse as he has high risk for secondary infection. Plastic surgeon advised Bactigras dressing for exposed areas and other supportive therapy. Skin biopsy report was consistent with STEVEN JOHNSON SYNDROME. SCORTEN score was 4, with an expected mortality of 58.3%.Tab acyclovir added on D4. His course of illness was complicated with multidrug resistant Acinetobacter bacteremia and skin infection with Acinetobacter and Klebsiella and was treated with Tigecycline and Imipenam and new central line. Initially he had intolerance to Feeding and was started on metoclopramide and started on high protein and glutamine sachets and later managed with proburn formula feed. Initially

for up to day7 he had positive fluid balance of up to 2-2.5 liter but later kept equal or on negative side since generalized swelling was present and had high CVP. Daily skin care was given by saline soaks or chlorhexidine soaks and banana leaves cleaned with chlorhexidine used over airbed sheet to avoid additional skin damage. Burn hood like instrument put anteriorly with bed sheet to cover body. Finally got discharged on day 25 with small wounds over his sacral region and both feet. **CONCLUSION:** Severe TEN case management requires a judicious use of Fluids and early appropriate treatment of secondary infections. Securing lines and dressing of wounds is challenging. But with a good supportive ICU care and Nutrition, mortality can be prevented as demonstrated in this case.

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## Intravenous fosfomycin therapy in critically ill patients infected with colistin resistant enterobacteriacae


**Presenting Author:** Dr. Dip Narayan Mukherjee
**Co-Authors:** Dr. Lalit Agarwal, Dr. Iqbal Nayyar, Dr. Kaushik Mandal


**Introduction:** Carbapenem resistant enterobacteriacae (CRE) emerged in recent years as one of the most challenging group of antibiotic resistant pathogens. Polymyxins are considered as the last resort for the treatment of infections with CR (Carbapenem resistant) gram negative bacilli (GNB). Inadequate or extensive use of colistin leads to emergence of colistin resistance in GNB (gram negative bacilli), jeopardizing treatment options in Intensive Care Units (ICUs), potentially increasing mortality and morbidity and necessitating prudent use of alternative antibiotics. Fosfomycin, a phosponic acid derivative which acts primarily by disrupting bacterial cell wall synthesis, is a broad spectrum antibiotic. Fosfomycin tromethamine is an oral formulation approved for the treatment of uncomplicated Urinary Tract Infection (UTI) caused by Multi Drug Resistant (MDR) bacteria. Recently fosfomycin is also available as sodium/disodium formulation for intravenous use, which is showing promising result against MDR (Multi Drug Resistant )/ PDR (Potentially Drug Resistant) pathogens. **Method:** A total of four colistin resistant (MIC>=4) GNB were isolated from ICU patients with nosocomial MDR infections. All four isolates were *Klebsiella pneumonia.* Among these isolates three were from blood and one from endotracheal aspirate and all four isolates were sensitive to fosfomycin *in vitro.* All of these patients had multiple co-morbidities with recent history of colistin exposure. Intravenous fosfomycin sodium (inj Fosmicin -Meiji/Japan) was started as a combination therapy with carbapenem. **Result:** Among the three bacterimic patients, two recovered completely from sepsis as well as the patient with ventilator associated pneumonia . There was clinical as well as microbiological cure with normalization of sepsis markers. The only one bacterimic patient who died during the course of therapy was later on diagnosed to have azole resistant fungemia as super infection. **Discussion:** Based on the evidence of clinical experience and available studies, intravenous fosfomycin therapy may be considered as the last option for the treatment of MDR (Multi Drug Resistant ) GNB (gram negative bacilli) infection where there is documented colistin resistance and where there is literally no other choice of antibiotic therapy. The success of the therapy is encouraging in selected group of patients. Further research on intravenous fosfomycin use specially against MDR pathogens and on the effectiveness and safety of the drug in the treatment of patients with such infections may be warranted.

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## Thirteen-year experience of over 1000 percutaneous dilatational tracheostomies (PDT) in a multidisciplinary intensive care unit (ICU) of a developing country


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**Objective:** To assess the risks and complications associated with the bedside PDT in our 13 years experience of over 1900 PDTs in ICU. **Introduction:** PDT is a relatively newer technique and has been introduced as an alternative to open tracheostomy as a safer and convenient procedure. However, the risks and complications of the PDT have not been highlighted in the ICU of a developing country. **Methods:** A retrospective analysis of the data gathered from patients undergoing PDT was done in a 54-bedded tertiary level multidisciplinary ICU of a teaching hospital. The data was collected between April 2000 and March 2014. All intubated patients with indications for elective tracheostomy, as well as patients who required emergency tracheostomy were included in the study. Demographic and other clinical details of the patients who underwent PDT were collected. Griggs technique was most commonly adopted while other adopted techniques were Ciaglia , white tusk/blue rhino tapered dilator and Percutwist technique. **Results.** A total of 1907 PDTs were done over a period of 14 years. Of the 1907 patients 1456 (76.35 %) were males and 451(23.65%) were females. 1863 (97.7%) PDT were done bedside in ICU while 44(2.3%) were done in wards, Coronary care unit, High-dependancy unit and Liver transplant unit. Griggs technique was adopted in 1738(91.14%), Ciaglia in 92(4.82%), white tusk/blue rhino tapered dilator technique in 69(3.62%) and Percutwist technique in 8(0.42%) patients. Long-term ventilation was the most common indication in 1162(60.93%) followed by airway protection in 1108(58.10%), facilitation of weaning in 272(14.26%) while airway obstruction/difficult intubation was observed in 7(0.37%) patients. Pre-procedure coagulopathy was observed in 341 (17.88%) patients, 12(0.63%) were morbidly obese while 12(0.63%) required emergency tracheostomy. Procedural complications were seen in 125(6.55%) patients. Details of complications to be discussed. No procedure related mortality was observed.

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## Early *Tracheostomy* is need of the hour in patients of advanced *Parkinsonism*


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**Introduction:** We report a case of 73 year old male patient who presented with complaints of dry cough since three months, chest discomfort for three weeks and rapidly worsening breathlessness since one day. He had a history of hypertension, Diabetes Mellitus, Mitral and Aortic Valve replacement twenty one years back, He was diagnosed with Parkinson's disease five years back and was taking Ropinirole, carbidopa, levodopa, rasagiline and Amantadine. On Examination he was found to be hypertensive and had crepitations in bilateral lung fields. Bilateral upper limb rigidity was present. His Investigations revealed Neutrophilic leucocytosis and raised NTProBNP (8085pg/ml**).** Chest radiograph revealed bilateral

infiltrates. His Echocardiogram revealed normally functioning Prosthetic heart Valves and Diastolic relaxation abnormality. He was initially managed on the lines of diastolic heart Faliure with diuretic, antihypertensive medication, Non Invasive ventilation and antibiotics were added to cover for community acquired pneumonia. His CXR worsened and patient became febrile, progressively tachypneic and was intubated and put on mechanical ventilation. HRCT chest revealed diffuse bilateral pulmonary infiltrates with bilateral Pleural effusion. A presumptive diagnosis of atypical pneumonia with superadded bacterial infection was made and treatment with broad spectrum antibiotics was started. Patient gradually improved clinically and radiologically and was extubated after 7 days of invasive ventilation. Post extubation patient had signs of aspiration on CXR. He was electively ventilated and tracheostomized and gradually weaned off ventilator and put on long term tracheostomy care and nasogastric tube feeding. There is high incidence of potentially fatal respiratory infections in Parkinson's disease, owing to impaired Cough & swallowing reflex and lack of saliva (due to anti- cholinergic effects of medications). In addition patients with Parkinson's have Restrictive Pattern Of pulmonary function abnormalities. These patients are known as silent aspirators .Aspiration pneumonia is the leading cause of death for people with Parkinson's disease. **Conclusion -** We conclude that early tracheostomy should be considered in patients with advanced Parkinson's disease to prevent aspiration pneumonia .This will help in reducing mortality and hospital length of stay.

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## Low cost innovations to support remote healthcare facilities

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**Introduction:** There is a significant gap in doctors per thousand population in India as compared to other countries like United States (0.7 vs 2.4) not to mention percentage of GDP spent on healthcare (4%) which is way low as compared to United States (17.9%), it assumes a much larger concern once we move from metropolitan towards smaller cities and town. We tried to explore how low cost innovations can be applied in such a situation. In present study use of electronic ICU (eICU) which was already in place was extended for better radiological image interpretation in unit lacking radiologist and picture archiving and communication system (PACS). **Methods:** This study was done in a Critinext affiliated hospital comprising of a total of 7 ICU beds from January to July 2014, where eICU was being used to provide 24×7 support. The eICU comprising of a remote command centre with intensivist and other requisite staff had complete access to patient's real-time vitals, hemodynamic parameters, lab values; audiovisuals and appropriately engineered smart alerts. Since unit was lacking in PACS, view box was deployed in a manner to facilitate remote visualization through camera already deployed for eICU purpose. All patients were actively screened by eICU, Electrocardiogram, X-ray and CT films with relevant clinical history were evaluated. Diagnosis, change in treatment course, clinical outcome in addition to baseline demographics, risk factors and severity score for all patients were recorded. **Results:** For a total of 421 admissions 113 eICU consults were given out of which 34 eICU consults involved improved diagnosis post radiological films viewing remotely (8%), most common was pulmonary edema 12 (35%) followed by pneumonia 8(23%), lung collapse 5(15%), stroke 5(15%) and pneumothorax 4(12%). Total emergency lifesaving consult confirmed on radiological film viewing were 9(2%) of which most common was lung collapse 5 (55%). Over all eICU influenced clinical management in 26.8% of patients. Mean age was 52.6±8.9 years, 57.2% were male and mean APACHE II score was 12.3±1.9. **Discussion:** Improving diagnosis, timely management of critically ill patients and avoiding routine and risky transfers to metropolitans from areas lacking in adequate healthcare expertise round the clock is a major challenge, although providing the optimum manpower and infrastructure is the best way but given the wide gap in availability it's unlikely in near future. In these circumstances eICU seems to be a promising alternate to bridge this demand-supply gap and extending the expertise available at tertiary care centres to remote facilities.

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## Various presentation of peripatum cardiomyopathy: A case series

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**Abstract** Peripartum cardiomyopathy (PPCM) a rare type of congestive heart failure of unknown etiology, that presents in late pregnancy or within five months after delivery. It is characterized by left ventricular systolic dysfunction due to dilated cardiomyopathy. Early diagnosis and initiation of treatment are essential to optimize pregnancy outcome, but the diagnosis is often delayed because of its symptoms may mimic those of normal pregnancy and postpartum period. We report 4 cases, which required admission to our intensive care unit (ICU) in the peripartum period for various reasons found to have PPCM when investigated and got improved after starting appropriate treatment.

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## Thinking beyond sepsis

Presenting author: Dr Shreekant R Champanekar

**Introduction:** We present here a rare case of Systemic Capillary Leak Syndrome (Clarkson's Disease). **Methods:** To describe our findings of Clarkson's Disease. **Results:** We present here a case of an 56 year old male presented to Sir Ganga Ram Hospital Casualty with one day history of vomiting, abdominal pain, generalized edema and oliguria. Patient was fully conscious and oriented with weak pulses with soft abdomen with generalized edema. Past history was suggestive of similar complaints one year back when he had hypoalbuminea and hemoconcentration with sterile cultures requiring mechanical ventilation and renal replacement therapy. Investigations persistently showed hypoalbuminea with hemoconcentration. All cultures were reported sterile. Based on past history and present complaints a diagnosis of Clarkson`s disease (Idiopathic Systematic Capillary Syndrome) was made. Treatment was initiated with fluids (cryatalloids and albumin) and vasopressor support. Respiratory distress necessitated initiation of mechanical ventilation. Patient developed AKI and Ischaemic hepatitis and required CRRT. Doppler study showed thrombus in both popliteal arteries onwards in both legs and thrombolysed with Heparin. Patient responded drastically to albumin and got extubated on day 5. Patient then progressively developed liver failure with portal vein thrombosis, thrombocytopenia and coagulopathy. Management and outcome will be discussed. **Discussion:** Only 150 cases of Clarkson's disease have been reported so far in literature. Idiopathic systemic capillary leak syndrome is a rare condition, first described in 1960 by Clarkson et al. Disease is characterized by unexplained episodic attacks of marked increase in capillary permeability, which causes the shift of fluid and protein from the intravascular to the interstitial space resulting in hypovolemic shock, hypoalbuminemia and hemoconcentration. Prompt institution of appropriate therapy reducec morbidity and prevent complications. A number of factors, including underrecognition in the medical community and rarity of the syndrome, have precluded analysis by rational clinical trial designs that are necessary to determine more targeted and adequate therapy, beyond the currently available symptomatic management strategies of SCLS.

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## Fourteen-year experience of over 1900 percutaneous dilatational tracheostomies (PDT) in a multidisciplinary Intensive Care Unit (ICU) of a developing country

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**Objective.** To assess the risks and complications associated with the bedside PDT in our 14 years experience of over 1900 PDTs in ICU. **Introduction.** PDT is a relatively newer technique and has been introduced as an alternative to open tracheostomy as a safer and convenient procedure. However, the risks and complications of the PDT have not been highlighted in the ICU of a developing country. **Methods.** A retrospective analysis of the data gathered from patients undergoing PDT was done in a 54-bedded tertiary level multidisciplinary ICU of a teaching hospital. The data was collected between April 2000 and March 2014. All intubated patients with indications for elective tracheostomy, as well as patients who required emergency tracheostomy were included in the study. Demographic and other clinical details of the patients who underwent PDT were collected. Griggs technique was most commonly adopted while other adopted techniques were Ciaglia , white tusk/blue rhino tapered dilator and Percutwist technique. **Results.** A total of 1907 PDTs were done over a period of 14 years. Of the 1907 patients 1456 (76.35 %) were males and 451(23.65%) were females. 1863 (97.7%) PDT were done bedside in ICU while 44(2.3%) were done in wards, Coronary care unit, High-dependancy unit and Liver transplant unit. Griggs technique was adopted in 1738(91.14%), Ciaglia in 92(4.82%), white tusk/blue rhino tapered dilator technique in 69(3.62%) and Percutwist technique in 8(0.42%) patients. Long-term ventilation was the most common indication in 1162(60.93%) followed by airway protection in 1108(58.10%), facilitation of weaning in 272(14.26%) while airway obstruction/difficult intubation was observed in 7(0.37%) patients. Pre-procedure coagulopathy was observed in 341 (17.88%) patients, 12(0.63%) were morbidly obese while 12(0.63%) required emergency tracheostomy. Procedural complications were seen in 125(6.55%) patients. Details of complications to be discussed. No procedure related mortality was observed.

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## Study of profile of nosocomial blood stream infection in PICU

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**Introduction** Nosocomial infections are responsible for significant morbidity and late mortality in hospitalized children. The rapid development of microbial resistance to conventional as well as newer antibiotics makes the problem more serious. Since there is very little data from India documenting, the prevalence and trend of nosocomial bloodstream infections in PICU, knowledge and magnitude of the problem, risk factors and outcomes, would help in surveillance, prevention and control measures. **Nosocomial blood steam infections** defined as isolation of the microorganism from the blood stream of the patients who develop signs of sepsis beyond 48 hours of hospital admission with or without local or systemic symptoms

**Aim**

- To study the profile of patients with nosocomial bloodstream infection, etiological organisms, sensitivity pattern and outcome in those patients.

**Methods**

- Duration – 14 months (May 2013 to July 2014)
- Type of study – Prospective observational study.

**Inclusion criteria:**

- Children aged 1month -18 years admitted in PICU for more than 48 hrs.
- Blood culture was taken in patients as a part of PICU care whenever there was fever or worsening of clinical or lab parameters
- The clinical profile of these patients was studied
- The organisms were classified according to their resistance pattern accordingly
- **Methicillin sensitive staphylococcus aureus (MSSA)** – Staphylococcus aureus sensitive to penicillinase-resistant penicillins like methicillin and cloxacillin.
- **Methicillin resistant staphylococcus aureus (MRSA)** – Staphylococcus aureus resistant to methicillin and cloxacillin.
- **Extended spectrum beta lactamase producing (ESBL) organism** – Bacteria are resistance to beta-lactum antibiotics, such as penicillins and cephalosporins.
- Carbapenamases – organisms producing carbapenemases which hydrolyse carbapenems and confer resistance against carbapenems.
- **Multi drug resistance (MDR)** is defined as non-susceptibility to at least one agent in three or more antimicrobial categories.
- **Extremely drug resistance (XDR)** is defined as non-susceptibility to at least one agent in all but two or fewer antimicrobial categories.
- **Pan drug resistance (PDR)** is defined as non-susceptibility to all agents in all antimicrobial categories.
- All statistical tests were carried out using SPSS v17 software. Student t-test was used for continuous variable and Chi-square test for discrete variable.

**Results**

- In the study period of 14 months (May 2013 to July 2014) 1062 patients stayed for more than 48 hours in Paediatric Intensive care unit.
- Blood culture was done in 732 patients out of which, blood culture was positive in 47 patients. (6%)
- 27.7% had central nervous system disorders
- Fever was the main indication for doing a culture

| Central line | Frequency | Percent |
|---|---|---|
| No: of patients with 1 line | 21 | 44.7 |
| No: of patients with 2 lines | 12 | 25.5 |
| No: of patients with no central line | 14 | 29.8 |
| Total | 47 | 100.0 |

- Among the 47 patients, 33 patients had either one or two central line during the period of stay in PICU.
- Among the 33 patient, 21 patients had one central line and 12 patients had two central lines which added up to **45** central lines inserted in total.
- Among the 33 patients with central lines 23 lines were inserted prior to 1st episode of nosocomial bloodstream infection and 10 lines were inserted later after the culture**.**
- **Hence 24** patients had only a peripheral line during the episode of nosocomial bloodstream infection.
- The number of femoral and internal jugular lines were nearly equal
- 36.2% of patients died and common cause of death was MODS

(64.7%)
- In our study nosocomial bloodstream infection was more prevalent among infants 12.8%, with (p- 0.00)
- 36.2% of patients with nosocomial BSI died which was statistically significant (p 0 .000)

**ORGANISM PROFILE**

In our study, among the 63 episodes, 41 (65.1%) were gram negative oraganism, 18 (28.6%) were gram positive organism and 4 (6.3%) were fungi.

| | 1st episode (%) | 2nd episode (%) | 3rd episode (%) | Total (%) |
|---|---|---|---|---|
| Gram negative organism | | | | |
| Acinetobacter | 9 (19.1) | 1 (7.7) | - | 10 (15.9) |
| Pseudomonas | 7 (14.9) | 4 (30.8) | - | 11 (17.5) |
| Klebsiella | 5 (10.6) | 2 (15.4) | - | 7 (11.1) |
| E. Coli | 3 (6.4) | - | - | 3 (4.8) |
| Burkholderia | 3 (6.4) | 1 (7.7) | - | 4 (6.3) |
| Enterobacter | 2 (4.2) | - | - | 2 (3.2) |
| Aeromonas | 1 (2.1) | - | - | 1 (1.6) |
| Proteus | 1 (2.1) | - | - | 1 (1.6) |
| Citrobacter | 1 (2.1) | - | - | 1 (1.6) |
| Providentia | - | 1 (7.7) | - | 1 (1.6) |
| Gram positive organism | | | | |
| Staphylococcus aureus | 6 (12.8) | 1 (7.7) | - | 7 (11.1) |
| Coagulase neg. staph | 6 (12.8) | 1 (7.7) | - | 7 (11.1) |
| Enterococcus | 1 (2.1) | - | 1 (33.3) | 2 (3.2) |
| Steptococcus | 1 (2.1) | 1 (7.7) | - | 2 (3.2) |
| Fungi | | | | |
| Candida tropicalis | 1 (2.1) | 1 (7.7) | 2 (66.7) | 4 (6.3) |
| Total | 47 | 13 | 3 | 63 |

In our study MRSA was present in 43% of Staphylococcus aureus

| Organism | ESBL (%) | Carbapenamase (%) |
|---|---|---|
| Acinetobacter (10) | 5 (50) | 3 (30) |
| Aeromonas (1) | 1 (100) | - |
| Burkholderia (4) | 1 (25) | 3 (75) |
| Citrobacter (1) | 1 (100) | - |
| E. coli (3) | 2 (66.7) | 1 (33.3) |
| Enterobacter (2) | 2 (100) | 1 (50) |
| Klebsiella (7) | 6 (85.7) | 4 (2) (57.1) |
| Providencia (1) | - | 1 (100) |
| Pseudomonas (11) | 7 (63.6) | - |

- None of the organism were pan drug resistant
- In the French national network REA RAISIN in 2013 (213 ICUs, 34 278 patients), the main causes of ICUacquired bacteremia were intravascular catheters (29.2%)
- Lakshmi et al found incidence of 30% in their study. Ravi et al (2) found an incidence of 25 %. Osazuwa et al found an incidence of 28.2% in his study.
- Jeya S. Yogaraj et al found about half of his patient were under 3 years of age Osazuwa et al found age group of less than 2 years involved In the French network, the main causes of catheter-related BSIs were coagulase negative staphylococci (28%), S. aureus (23%), P. aeruginosa (12%), E. coli (8%)
- Lakshmi et al found the mortality outcome outcome of patients with nosocomial blood stream infection was statistically significant. Galia et al found statistically significant mortality rate in patients in patients with BSI

**CONCLUSION**

- 24 (38%) of positive blood cultures out of 63 were from patients with only peripheral lines
- The incidence and fatal outcome due to nosocomial bloodstream infection was more among infants..
- 36.2% patients with nosocomial bloodstream infection had adverse outcome which was statistically significant.
- Gram negative organisms were the most common cause of nosocomial bloodstream infection, among them (67%)
- Most of them were ESBL producing organisms

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## An audit of critical incidents in the Intensive Care Unit of a tertiary care hospital

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**Introduction** Sir Francis Galton first laid the foundation for Critical Incident (CI) Technique in early 1900s; later John C. Flanagan carried out the work on critical incidents during 2nd world war in Aviation industry. In 1970s this concept was introduced to investigate anesthetic mishaps. Late 70s and in early 80s investigators started looking (CI) in Intensive Care Units (ICU). A CI was defined as any incident, which affected or could have affected the safety of the patient while under ICU management. We have conducted an audit in our ICU by collecting data from CI reports from January 2011 to December 2013 and presented in this paper. **Method** CI form is to be filled and deposited in the locked letterbox by a person either involved or identified the event. Format of the form includes time of the incident, time of documentation, place of incident, type of incident and their contributory factors. Report also includes the perceived hazard, outcome of the incident and whether the incident was informed to relatives. Suggestions from the informant were also collected. **Results** Data was collected from St. johns ICU over a 36 months period. A total of 286 CIs were reported. Nurses reported majority of CIs (81%) and most of them were detected by consultants (48%). On further scrutiny of data it was found the dislodgment lines/tubes 64(22%) and medication error 60(21%) were most common. Miscellaneous group include 83 (29%) reports among these charting errors, failing to maintain aseptic precautions, accounted for the most. Failed recognition (33%), wrong technique (17%), failed anticipation (15.5%), distraction (14%) and protocol violation (12%) were the common contributing factors. Human error contributed to 98%of events and most of them were avoidable. Most of these CIs occurred during daytime 184(68%) and nursing or medical staffs involved were less than 6 months experience. No unfavorable outcome was perceived in 244(87%) whereas reversible morbidity in 28 severe morbidity in 6 and death in 3. The common perceived hazard involved CVS 28% and RS 23%. **Discussion** Our aim of the study is to identify the causes and contributory factors of CIs and formulate the preventive strategies. We introduced CI reporting in our ICU to increase quality care. In our study the nursing staff reported most of the CIs and the most common error were related to dislodgment of indwelling lines and medication errors. Shortage of staff seems to be a major contributing factor. British Association of Critical Care Nurses recommends one nurse for each patient as the gold standard in critical care nursing which looks quite optimistic at present time. We conduct internal audits on all CIs that lead to major mishaps and investigated at grass root level. Displaying Trouble shoot flow charts of common incidents in the ICU, inculcating reflective learning among medical staff, increasing the manpower, supervision and additional training for newly recruited staff in ICUs, improving communication skills are some of the measures hopefully decreases CIs. There are several limitations of this study. Most important of these is the reporting bias. There is lack of clarity regarding what should be reported and underreporting is a common problem. Some incidents were not reported for fear of reprisal. Reporting by the doctors was poor. Outcome of the preventive strategies was not analyzed. To conclude, analysis of CIs helps us to identify

the common human errors, to raise awareness and to implement preventive strategies. CIs most commonly involve medication errors, dislodgment of lines/tubes. Human errors contributed for the most and were avoidable. Reflective learning, increasing manpower, improving communication, CMEs are effective ways to prevent CIs.

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## Severity scoring systems: The indian situation

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**Introduction:** Critical care scoring systems are widely used all over the world. They help to predict population based outcome, provide comparative data and assess resource use. There is urgent need for organisations like ICNARC (Intensive Care National Audit and Research Centre) in India to come up with scoring systems which is based on data derived from local population. However it is not known how widely these scoring systems are used in Indian ICU's. The purpose of this survey was to find out the characteristics of Severity scoring systems used in Indian ICU's. **Methods:** We sent email with a link to the survey to all the ICU heads registered with ISCCM and a reminder was sent twice after that. Senior trainees of different ICU's were also requested to complete the survey when no response was received from any of the ICU heads. Questions asked in the survey included whether scoring system was used in their ICU's, how long they have been using the scoring systems, what scoring systems were used, who collected the data and whether SMR was calculated using reference standards. **Results:** Email was sent to 95 ICU heads of which 8 replied back. Other responses were collected from registrars across ICUs in the country. 91% had general ICU, 33% had cardiac ICUs, 25% had renal and trauma ICU each. 42% had open ICU, 50% had semi close ICU. and7% had close ICU system. 57% had >20 ICU bed. Only 61% of them used ICU severity scoring system. 50% of them used SOFA score whereas 37% used APACHE II severity scoring system. 45% of data collection is done by the ICU registrars, 33% of the ICU had their data collection done by the nurses. 75% of the ICU had data collection over 1 year. 62% of ICU compared their data with reference standards. **DISCUSSION:** The main prognostic models for assessing the overall severity of illness in critically ill adults are Acute Physiology and Chronic Health Evaluation (APACHE), Simplified Acute Physiology Score (SAPS), and Mortality Probability Model (MPM). SAPS and MPM have been updated to their third versions and APACHE to its fourth version. The development of prognostic models is usually followed by internal and external validation and performance assessment. The overall response rate was low. 20% of ICU heads took part in the survey. It is possible that mainly those clinicians where their ICU's used some scoring systems responded to the request to participate in the survey. Out of those ICU's who responded only around 60% of ICUs used some critical care severity scoring system, with SOFA score being used commonly. Only 62% of ICU compared their data with reference standards. In India there is very low use of Severity scoring systems in ICU. There is urgent need for an organisation like ICNARC to be established in India to encourage use of Severity scoring systems in ICU's. Indian population specific data will help in coming up with benchmark applicable for Indian population.

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## Correlation study of xcyton SES CSF analysis and conventional CSF analysis in patients with suspected meningo-encephalitis admitted to manipal hospital

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**Introduction:** Xcyton's Syndrome Evaluation System (SES) allows for the simultaneous identification of multiple organisms like bacteria, viruses, fungi and parasites from a single sample. It is a molecular biology test, which involves DNA extraction, amplification and sequence specific hybridization for identification of virulence-associated genes of causative agents. CSF Xcyton SES is not the standard test for the diagnosis of meningo-encephalitis in our hospital. However SES is increasingly being used in addition to the conventional tests in the management of patients with suspected meningo-encephalitis to increase the diagnostic yield. As a result many patients have undergone both tests. We devised this retrospective study to analyze if there was any correlation between CSF Xcyton SES and conventional tests for the diagnosis of meningo-encephalitis in patients where both tests were undertaken. Our conventional CSF tests included Gram staining, AFB staining, India Ink preparation, Cryptococcal antigen test, HSV PCR, MTB PCR and Cultures (bacteria, fungal and MTB). **OBJECTIVE:** What is the correlation between CSF Xcyton SES and conventional tests for the diagnosis of meningo-encephalitis in patients where both tests were undertaken? **Methods:** Study design—Retrospective study Inclusion criteria: Patients with signs and symptoms of meningitis/ meningoencephalitis who had both conventional CSF tests and Xcyton SES analysis. Exclusion criteria: Patients with signs and symptoms of meningitis/ meningoencephalitis where either conventional CSF test or Xcyton SES analysis was not done. **Results:** Total number of patients was 47 Of this 60% were male, 66% were between 20 and 50 years . Commonest symptoms were fever (42.5%) and headache (23.4%). 89% of patients had GCS above 8/15. 40% of patients Total Cell Count were above 11000/cu. mm. For the purpose of analysis Conventional CSF test was taken as gold standard and results of the Xcyton SES analysis were compared with this. True positive rate was 4.3%, True negative rate was 72.3%, False positive rate was 21.3% and false negative rate was 2.1%. Xcyton SES analysis has a Negative Predictive value of 97.14%, Positive predictive value of 16.67% with sensitivity of 66.7% and specificity of 77.27%. **Discussion: Conclusion and limitations** Xcyton SES analysis of CSF has high Negative predictive value and low positive predictive value. Based on results of our study we conclude that Xcyton SES analysis of CSF is more useful to exclude infective causes of meningo -encephalitis. However well conducted multi-center randomized controlled trials are needed to validate the results of our study.

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## Risk factors for cardiac arrhtymias in a medical ICU

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**Objective:** we performed a study in a medical ICU at tertiary care hospital in India to determine types, incidence and determinants of cardiac arrhythmias. **Methods:** successive patients admitted to general medicine non-cardiac ICU were enrolled over 12 months in 2013-14. Details of diagnosis at admission, associated diseases, treatments, and type of arrhythmias. Patient with pre-existing arrhythmias were excluded. Details of terminal arrhythmias and unifocal ventricular ectopics were excluded from analysis. **Results:** we recruited 402 patients (age 53.4±20, men 66%). Reason for admission were respiratory 61%, digestive/liver 31%, neurological 29%, renal 25%, cardiovascular 22%, and trauma 9%. No comorbidity was In 47%, 1-3 in 48%, and ≥4 in 4%. Other comorbidities included hypertension 38%, diabetes 29%, chronic renal failure 15%, cardiovascular disease 12%, COPD 8% and heart failure 3%. Incidence of new arrhythmia was in 81 (201/1000) and included atrial fibrillation 41 (102/1000), bradycardias 27 (67/1000), ventricular tachycardia 8 (20/1000) and supraventricular tachycardia in 3 (7/1000). Significant risk factor were age>60 years, diabetes and hypertension and precipitating factors were acidosis, dyselectrolytemia, hypoxia and septicemia ($p<0.05$). **Conclusions:** common arrhythmias in medical ICU are atrial fibrillation and bradycardias. Age multiple co-morbidities, hypertension and diabetes are risk factors while acidosis, electrolyte disturbances, hypoxia and septicemia precipitating factors.

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## Survey on management of severe intensive care unit (ICU) infections: Clinical experience with colistin methaneulfonate (CMS)

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**Abstract Background:** The emergence of multidrug-resistant (MDR) Gram-negative bacteria (GNB) in along with the lack of new antibacterial agents led scientists to understand the importance of polymyxins. There has recently been a tremendous increase in infections caused by MDR Gram-negative bacteria, especially *Pseudomonas aeruginosa, Acinetobacter baumannii* and *Klebsiella pneumoniae,* and for these species, polymyxins are often the only available active antibiotic. Polymyxins consist of polymyxins A–E, of which polymyxinB (PMB) and polymyxin E, or Colistin Methanesulfonate (CMS), are currently available in the market. **Objectives:** This survey was aimed to determine usage profile of Colistin Methanesulfonate and physician's clinical experience with it in the management of severe ICU infections. **Methods:** This survey was based on the clinical experience of 32 randomly selected physicians on an aggregate patient basis in the management of MDR, GNB infections from different parts of India. Prescription Event Monitoring (PEM) Forms comprising of various questions were filled up by these physicians. Data from 285 patients were analyzed. **Results:** Of 285 patients having severe ICU infections 61.76 % were males and 38.24 % were females. Physicians observed that 91.58 % of the patients were effectively managed with CMS. Most common indication for CMS therapy was Sepsis (53.26 %). Doripenem, Imipenem+ Cilastin, Meropenem, Tigecycline, Amikacin, combination of Beta lactam + Beta Lactam inhibitors, Cephalosporin's were most common concomitant medicines prescribed. Sepsis was most common indication. Renal function was normal in 53.33 % of patients admitted in ICU for severe infections. According to antibiotic sensitivity report, infections due to *E.Coli* were most susceptible (94.39 %) followed by *Acinetobacter baumannii* (82.43 %). Most resistant infections were due to *Proteus mirabilis* (23.68 %). **Conclusion:** severe ICU infections caused by multi drug resistant gram negative bacterial infections like *E. coli, Acinetobacter baumannii, Pseudomonas aeruginosa, Klebsiella pneumoniae and Proteus mirabili*s, were effectively managed with CMS. **Key words:** multidrug-resistant (MDR), Gram-negative bacteria (GNB), Colistin Methanesulfonate (CMS), Intensive Care Unit (ICU) infections, *Acinetobacter baumannii, Pseudomonas aeruginosa*