Introduction:
Individualized mechanical ventilation (MV) in patients with ARDS may potentially reduce ventilator induced lung injury (VILI). We explore bedside approach of Electronic Impedance tomography (EIT) to evaluate the percentage of potentially recruitable lung in ARDS patients, and assess the efficacy of PEEP on cyclic R/D in ARDS patients with different recruitability.

Methods:
This is a prospective observational study. Patients with moderate and severe ARDS (PaO$_2$/FiO$_2$ < 200 mmHg) are enrolled. PEEP detrimental titration method (from 24 to 6 cmH$_2$O) is used to estimate percentage of potentially recruitable lung, calculated by electrical impedance algorithm. ARDS patients are divided to non-recruitable and recruitable group with the median. According to ARDS net FiO$_2$/PEEP table, PEEP is set to routine and high PEEP (PEEP$_R$/PEEP$_H$). Electrical impedance is recorded by EIT. Ventilation distribution is evaluated by $i_z$, GI, alveolar collapse and hyperinflation percentage, RVDI. Respiratory mechanics parameters and gas exchange parameters are recorded.

Results:
20 patients are enrolled and 10 patients are divided to non-recruitable and recruitable group separately. When PEEP is set at PEEP$_R$ or PEEP$_H$, there is no significant difference in ventilation distribution in dependent lung and independent lung, recruitable alveolar collapse and hyperinflation percentage between non-recruitable (NR) and recruitable (R) group (P>0.05). Compared with PEEP$_R$, ventilation distribution ($i_z$) increase in dependent lung and decrease in independent lung, recruitable alveolar collapse decrease significantly and hyperinflation significantly increase in NR and R group at PEEP$_H$. At PEEP$_H$, cyclic R/D in ROI4 is significantly higher in NR group than R group. Compared with PEEP$_R$, cyclic R/D doesn’t change globally and in ROI1-4 in NR and R group at PEEP$_H$.

Conclusion:
High PEEP strategy can improve ventilation distribution, but it can only decrease cyclic recruitment/derecruitment in the dorsal part of ARDS patients in recruitable group.