ICU Care Bundle Practices

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Bundles, According to the IHI

A "**bundle**" is a

group of evidence-based care components

for a given disease that, when executed together, may result in better outcomes than if implemented individually.

Institute for Health Care Improvement (IHI)

Bundles, According to the IHI

- In a bundle, the individual elements are built around best evidence-based practices.

- The science supporting the individual treatment strategies in a bundle is sufficiently mature such that implementation of the approach should be considered either best practice or a reasonable and generally accepted practice.

IHI Critical Care Bundles

- Ventilator Associated Pneumonia Prevention Bundle (VAP)
- Central Line Bundle
- Severe Sepsis Bundles



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ICU BUNDLES

VAP Prevention Bundle	Central Line Maintenance Bundle	Acute Sepsis Bundle Complete within 6 Hours of Diagnosis	UTI Prevention Bundle
Elevation of the head of the bed 30 – 45	Optimal catheter site selection with avoidance of the femoral vein for central venous access in adult patients	Obtain appropriate cultures	Avoid indwelling catheterization unless there is a compling indication.
Daily sedation and vacation and assessments of readiness to be extubated.	Maximum barrier precaution during insertion	Obtain plasma, lactate level	Allow only trained health care workers to insert catheter
Daily oral care with every 4th hourly	Hand Hygiene before manipulation of the IV system	Administer appropriate antibiotics	Wash hands and wear gloves
Peptic ulcer disease prophylaxis	Access ports are sanitized with alcohol before and after and after each use, a method known as the "scrub the hub" protocol	Achieve the following goals CVP = 8 – 12 mm Hg MAP ≥65mmHg Urine output ≥ 0.5ml/kg/hr SvcO2 ≥ 65% or ScvO2 ≥ 70% Sepsis management bundle comp-lete within 24 hours of diagnosis.	Part preparation and perineum cleaned with Betadine
Deep vennus thrombosis prophylaxis	Change gauze dressing every 2 days, clear dressing every 7 days (and more frequently if soiled damp or loose)	Administer low dose steroid if indicated	Use aseptic technique for catheter insertion
Closed suction system with continuous removal of subglottic secretion	Caps are changed no more often than 72 hours	Maintain blood glucose levels at 100 – 180 mg/dl	Connected to Urin xen bag for catheter insertion
Hand washing before and after contact with each patients	Open lumens (such as catheter hubs or stopcocks) are covered by injection port, sterile end – caps or needleless connection	Maintain plateau airway pressure at ≤30 cmH2o in ventilator – Dependent patients	Drainage bag attached to side of bed and below the level of the bladder. Drainage bag and tubing do not touch the floor.
ET pressure monitoring at – at ≤30 cmH2o	IV set is replaced no more frequently than every 72 hours	WASH YOUR HANDS Spread the word Not the germs	Drainage BAG + 2/3rd full and emptied prior to transport
HME filter change – every 3 days	IV set replaced immediately after administration of blood / blood products		Use a Securing Device to prevent movement of the catheter
	Details or removal documents of the record (including date)		Daily mealal care
	Daily review of line necessity with prompt removal of unnecessary lines		Daily review of catheter necessity and prompt removal of device

VAP BUNDLE

http://www.ihi.org/IHI/Topics/CriticalCare/IntensiveCare/Changes/ImplementtheVentilatorBundle.htm

Ventilator-Associated Pneumonia (VAP)Bundle

- DVT prophylaxis
- GI prophylaxis
- Head of bed (HOB) elevated to 30-45°
- Daily Sedation Vacation
- Daily Spontaneous Breathing Trial

connected

Ventilator-Associated Pneumonia (VAP)Bundle

DVT prophylaxis: tips

- Include deep venous prophylaxis as part of your ICU order admission set and ventilator order set. Make application of prophylaxis the default value on the form.
- Include deep venous prophylaxis as an item for discussion on daily multidisciplinary rounds.
- Empower pharmacy to review orders for patients in the ICU to ensure that some form of deep venous prophylaxis is in place at all times on ICU patients.
- Post compliance with the intervention in a prominent place in your ICU to encourage change and motivate staff.

Ventilator-Associated Pneumonia (VAP)Bundle

GI prophylaxis: tips

- Include peptic ulcer disease prophylaxis as part of your ICU order admission set and ventilator order set. Make application of prophylaxis the default value on the form.
- Include peptic ulcer disease prophylaxis as an item for discussion on daily multidisciplinary rounds.
- Empower pharmacy to review orders for patients in the ICU to ensure that some form of peptic ulcer disease prophylaxis is in place at all times on ICU patients.
- Post compliance with the intervention in a prominent place in your ICU to encourage change and motivate staff.

Ventilator-Associated Pneumonia (VAP)Bundle

Head of Bed elevation: tips I

- Implement a mechanism to ensure head-of-the-bed elevation, such as including this intervention on nursing flow sheets and as a topic at multidisciplinary rounds.
- Create an environment where respiratory therapists work collaboratively with nursing to maintain head-of-the-bed elevation.
- Involve families in the process by educating them about the importance of head-of-the-bed elevation and encourage them to notify clinical personnel when the bed does not appear to be in the proper position.

Ventilator-Associated Pneumonia (VAP)Bundle

Head of Bed elevation: tips II

- Use visual cues so it is easy to identify when the bed is in the proper position, such as a line on the wall that can only be seen if the bed is below a 30-degree angle.

- Include this intervention on order sets for initiation and weaning of mechanical ventilation, delivery of tube feedings, and provision of oral care.

- Post compliance with the intervention in a prominent place in your ICU to encourage change and motivate staff.

Ventilator-Associated Pneumonia (VAP)Bundle

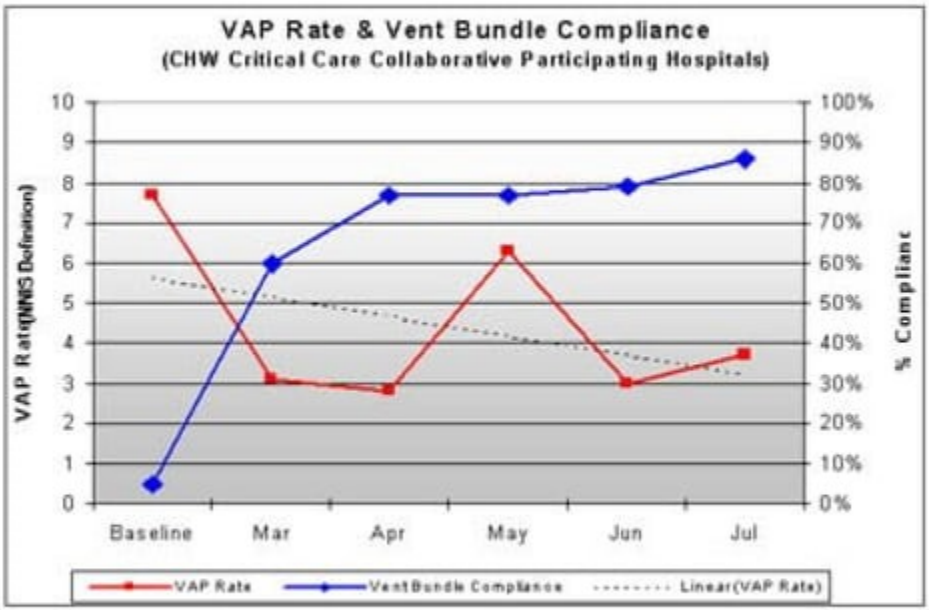
Daily sedation vacation/ Spontaneous Breathing Trials: tips I

- Implement a protocol to lighten sedation daily at an appropriate time to assess for neurological readiness to extubate.
- Include precautions to prevent self-extubation such as increased monitoring and vigilance during the trial.
- Include a sedation vacation strategy in your overall plan to wean the patient from the ventilator
- if you have a weaning protocol, add "sedation vacation" to that strategy.

Ventilator-Associated Pneumonia (VAP)Bundle

Daily sedation vacation/ Spontaneous Breathing Trials: tips II

- Assess that compliance is occurring each day on multidisciplinary rounds.
- Consider implementation of a sedation scale such as the Riker scale to avoid oversedation.
- Post compliance with the intervention in a prominent place in your ICU to encourage change and motivate staff.


VAP Rate & Vent Bundle Compliance
(CHW Critical Care Collaborative Participating Hospitals)
VAP Rate(NHSN Definition)
% Compliance
10
9
8
7
6
5
4
3
2
1
0
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Baseline
Mar
Apr
May
Jun
Jul
VAP Rate
Vent Bundle Compliance
Linear (VAP Rate)

Central Line BUNDLE

http://www.ihi.org/IHI/Topics/CriticalCare/IntensiveCare/Changes/ImplementtheCentralLineBundle.htm

Central line bundle

- Hand Hygiene
- Maximal Barrier Precautions Upon Insertion
- Chlorhexidine Skin Antisepsis
- Optimal Catheter Site Selection, with Avoidance of the Femoral Vein for Central Venous Access in Adult Patients
- Daily Review of Line Necessity with Prompt Removal of Unnecessary Lines

Hand Hygiene: tips I

- Empower nursing to enforce use of a central line checklist to be sure all processes related to central line placement are executed for each line placement.
- Include hand hygiene as part of your checklist for central line placement.
- Keep soap/alcohol-based hand washing dispensers prominently placed and make universal precautions equipment, such as gloves, only available near hand sanitation equipment.

Hand Hygiene: tips II

- Post signs at the entry and exits to the patient room as reminders.
- Initiate a campaign using posters including photos of celebrated hospital doctors/employees recommending hand washing.
- ***Create an environment where reminding each other about hand washing is encouraged.***
- Signs often become "invisible" after just a few days. Try to alter them weekly or monthly (color, shape size).

Central line bundle

Maximal Barrier Precautions Upon Insertion: tips

- Empower nursing to enforce use of a central line checklist to be sure all processes related to central line placement are executed for each line placement.

- Include maximal barrier precautions as part of your checklist for central line placement.

- Keep equipment ready stocked in a cart for central line placement to avoid the difficulty of finding necessary equipment to institute maximal barrier precautions.

Central line bundle

Chlorhexidine skin antisepsis: tips

- Empower nursing to enforce use of a central line checklist to be sure all processes related to central line placement are executed for each line placement.
- Include Chlorhexidine antisepsis as part of your checklist for central line placement.
- Include Chlorhexidine antisepsis kits in carts storing central line equipment. Many central line kits include povidone-iodine kits and these must be avoided.
- Ensure that solution dries completely before an attempted line insertion.

Central line bundle

Optimal catheter site selection: tips

- Empower nursing to enforce use of a central line checklist to be sure all processes related to central line placement are executed for each line placement.

- Include optimal site selection as part of your checklist for central line placement with room for appropriate contraindications (e.g., bleeding risks).

Central line bundle

Daily review of Lines/ Prompt removal: tips

- Empower nursing to enforce use of a central line checklist to be sure all processes related to central line placement are executed for each line placement.
- Include daily review of line necessity as part of your multidisciplinary rounds.
- Include assessment for removal of central lines as part of your daily goal sheets.
- Record time and date of line placement for record keeping purposes and evaluation by staff to aid in decision making.

Severe Sepsis BUNDLES

http://www.ihi.org/IHI/Topics/CriticalCare/Sepsis/Changes/

Severe Sepsis BUNDLES

Surviving Sepsis Campaign

Severe Sepsis

The 3-Hour Resuscitation Bundle and

The 6-Hour Septic Shock Bundle

Severe Sepsis BUNDLES

The Severe Sepsis 3-Hour Resuscitation Bundle contains the following elements, to be completed within 3 hours of the time of presentation:

1. Measure Lactate Level

2. Obtain Blood Cultures Prior to Administration of Antibiotics

3. Administer Broad Spectrum Antibiotics

4. Administer 30 mL/kg Crystalloid for Hypotension or Lactate ≥4 mmol/L

Severe Sepsis BUNDLES

6-Hour Septic Shock Bundle: Evidence-based goals that must be completed within 6 hours for patients with severe sepsis.

1.Apply Vasopressors (for Hypotension That Does Not Respond to Initial Fluid Resuscitation to Maintain a Mean Arterial Pressure (MAP) ≥65 mm Hg)

2. In the Event of **Persistent Arterial** Hypotension Despite Volume Resuscitation (Septic Shock) or Initial Lactate ≥4 mmol/L

a. Measure Central Venous Pressure (CVP)
b. Measure Central Venous Oxygen Saturation (ScvO2)

3. **Remeasure Lactate** If Initial Lactate Was Elevated

Severe Sepsis BUNDLES

Sepsis resuscitation bundle

- describes **seven** tasks that should begin immediately, but must be **accomplished within the first 6 hours** of presentation for patients with severe sepsis or septic shock.

- **Some items may not be completed** if the clinical conditions described in the bundle do not prevail in a particular case, but clinicians should assess for them.

- The goal is to perform all indicated tasks 100 percent of the time within the first 6 hours of identification of severe sepsis.

Critical Care Bundle: Conclusions

- Listed the contents of the IHI Critical Care bundles
  - VAP
  - Central Line
  - Severe Sepsis

Critical Care Bundle: Conclusions

Care bundles **originated** in **North America** and are described best as groups of evidence-based practice interventions

The theory behind care bundles is that **when several evidence-based interventions are grouped together** in a single protocol, it will improve patient outcome

Care bundles are relatively **easy** to **develop**, **implement** and **audit**, and provide practitioners with a practical method for implementing evidence-based practice

More and more data that the use of these patient-safety bundles are associated with improved outcomes

Some clinicians **disagree** with the **validity of the combined content**

Critical Care Bundle: Conclusions

Nevertheless, it is **becoming part of standard practice** for us to document our awareness of these patient-safety initiatives

Thank You

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Appajigol

Riker Sedation-Agitation Scale (SAS)

Score	Term	Descriptor
7	Dangerous Agitation	Pulling at ET tube, trying to remove catheters, climbing over bedrail, striking at staff, thrashing side-to-side
6	Very Agitated	Requiring restraint and frequent verbal reminding of limits, biting ETT
5	Agitated	Anxious or physically agitated, calms to verbal instructions
4	Calm and Cooperative	Calm, easily arousable, follows commands
3	Sedated	Difficult to arouse but awakens to verbal stimuli or gentle shaking, follows simple commands but drifts off again
2	Very Sedated	Arouses to physical stimuli but does not communicate or follow commands, may move spontaneously
1	Unarousable	Minimal or no response to noxious stimuli, does not communicate or follow commands

Urinary Catheter Care Bundle

- **Insertion**
  - Insert only for specific reasons
    - Urinary output in critical ill
    - Bladder outlet obstruction or neurogenic bladder dysfunction
    - Prevent contamination of sacral wounds
    - Terminal care
  - Competent HCW to insert
  - Aseptic technique
  - Closed system with bag below bladder

Urinary Catheter Care Bundle

- **Management**
  - Review need for catheter daily
  - Empty when ¾ full and use clean container for each patient
  - Secure catheter to leg/abdomen
  - Urine samples from sampling port only
  - Hand hygiene & PPE before and after any catheter care