BUNDLES OF CARE

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Director of Nursing-DH

OBJECTIVES

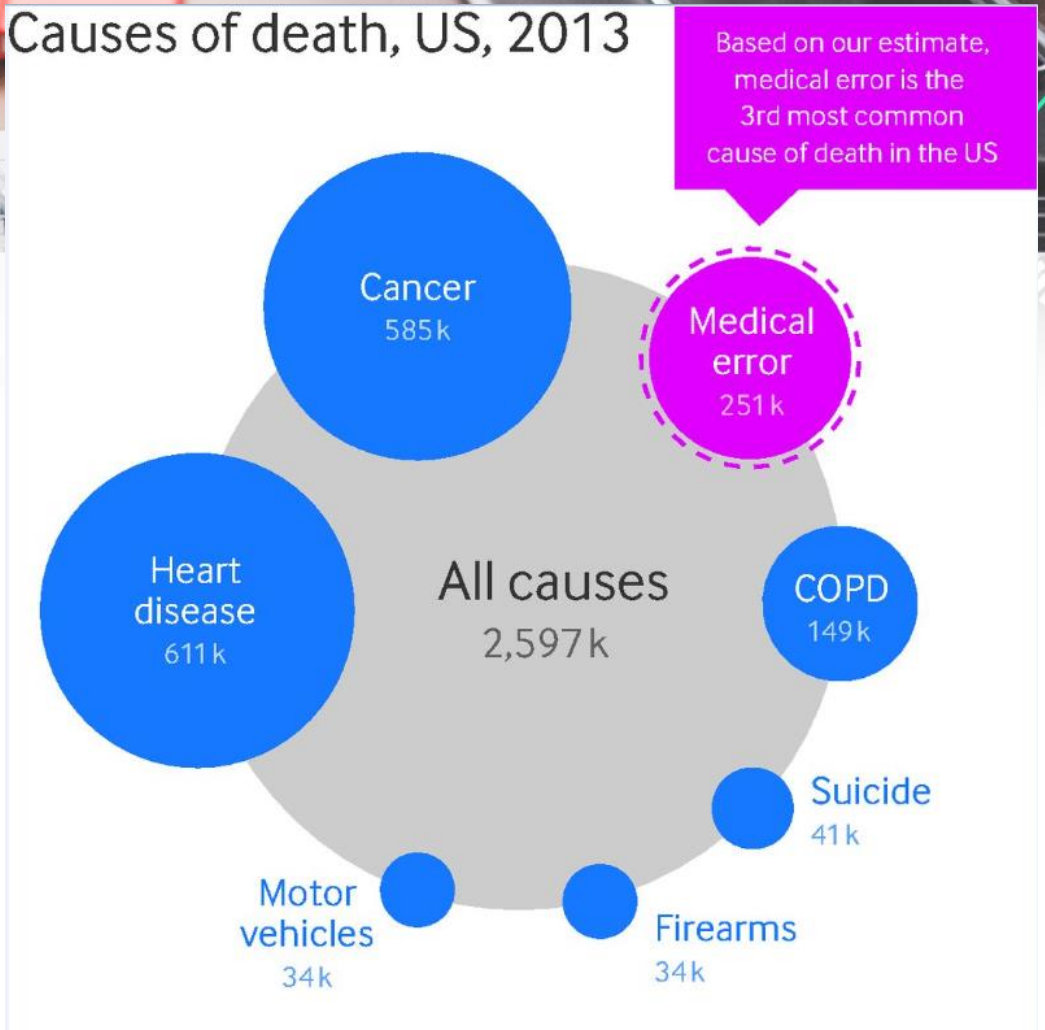
- Highlight the introduction of care bundles.
- Discuss the elements of bundles of care.
- Discuss and interpret VAP, CLABSI and CAUTI rates in DH in comparison with the international benchmark.
- Recommendations

Top worry of patient ?


3rd


HEALTH
CARE


ERROR


Causes of death, US, 2013
Based on our estimate, medical error is the 3rd most common cause of death in the US
Cancer
585k
Medical error
251k
Heart disease
611k
All causes
2,597k
COPD
149k
Suicide
41k
Motor vehicles
34k
Firearms
34k

Errors are inevitable

…….but most are preventable

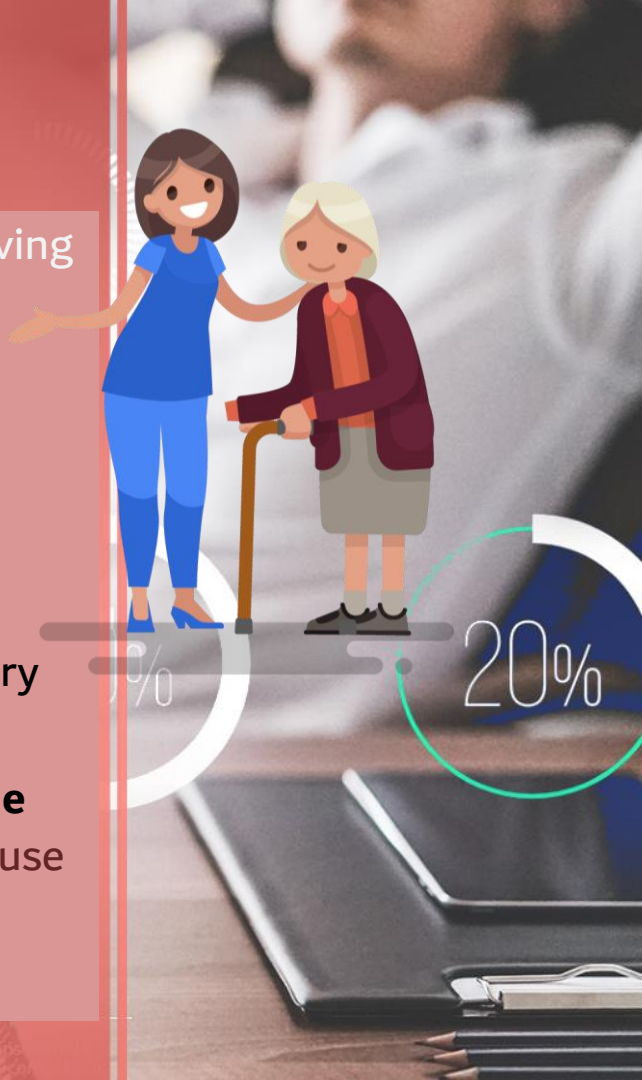
Common Patient Safety Complaints

- Inadequate hand washing practiced by staff /personal in healthcare .
- Incompliance in Infection control practices as no evident change of gloves between patients .
- Inappropriate use of PPE .
- Administration of a wrong medication .
- Unsafe procedures practiced by staff .
- Lack in skills on IV cannulations .
- Inappropriate/inadequate patient assessments .
- Incomplete documentation .

INTRODUCTION

Healthcare quality and cost are major driving forces in our evolving healthcare delivery system.

- The power of a **bundle comes from the body of science**. Institute for Health Care Improvement (IHI), USA has developed the concept of 'Bundle' to help clinicians deliver bedside care more reliably and effectively .
- This concept has been initiated as a quality improvement process as it was realized that clinicians' practice pattern vary and to have **standard guidelines of care**.
- These bundles and their outcomes have become **measurable and reportable** quality metrics for ICU's and hospitals because they can be easily audited.

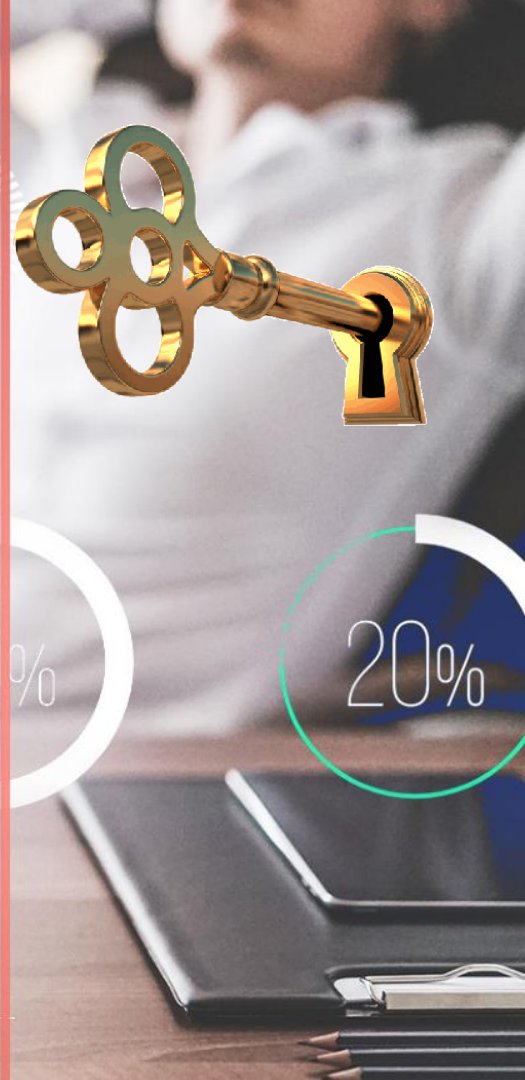


KEY POINTS

- A care bundle is a group of **three to five evidence-based interventions** which, when performed together, have a better outcome than if performed individually.

- Care bundles can be used to ensure the delivery of the **minimum standard of care**.

- They can be used as an **audit tool** to assess the delivery of interventions but do not assess how well individual interventions are performed.

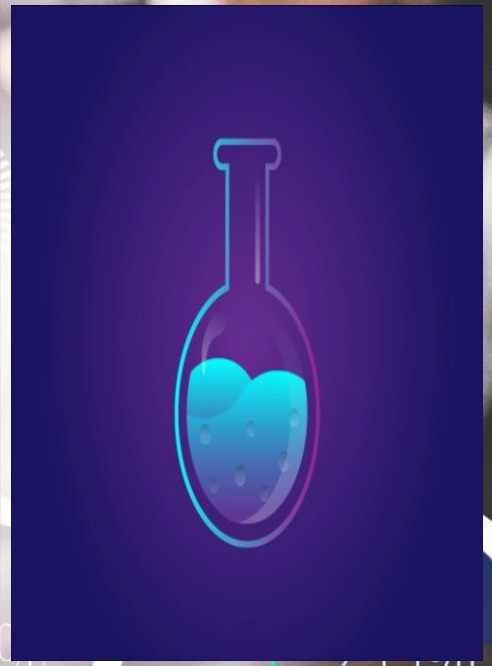


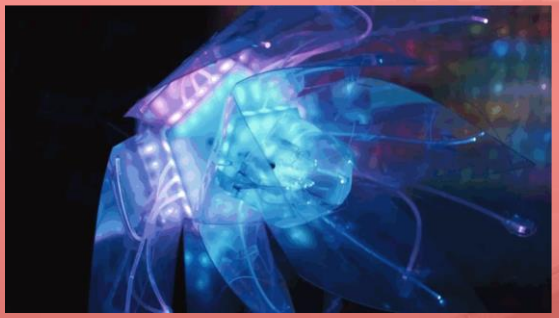
SPECIFIC ELEMENTS OF A BUNDLE

- All the elements of the bundle are necessary and removing any one of them will result in inferior result.
- All the elements in the bundle are based on randomized controlled trial (Level 1 evidence) and the recommendations are beyond any controversy.
- Implementation of all Bundle elements should take place simultaneously at a specific time and place with a minimum delay.

Bundles are not a magic

That they work alone



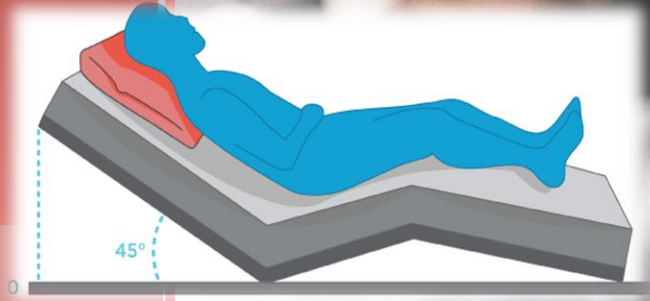


TYPES OF BUNDLES

The following three bundles are most widely practiced in critical care units :

- **Ventilator Associated Pneumonia (VAP) Bundle**
- **Central Line Bundle**
- **Urinary Catheter Bundle**

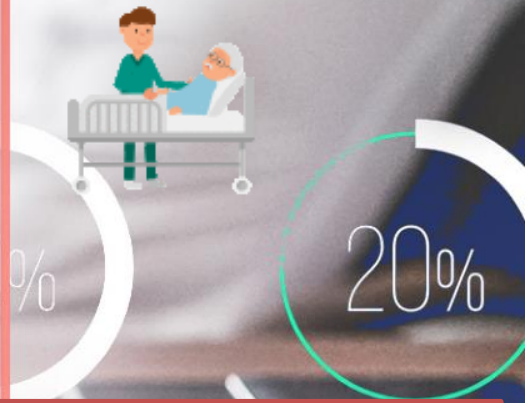
1. VAP BUNDLE



The key components of a VAP Bundle:

1. Elevation of the head of bed 30-45 degrees:

Elevating head of the Bed to 30-45 degree is one of the most simple and effective way of preventing Ventilator Associated Pneumonia (VAP). The semi recumbent position may decrease chances of oropharyngeal aspiration or aspiration of gastric contents, which may take place even in intubated patient and is a source for VAP.



(Draculovic et al.,1999) conducted a randomized controlled trial in 86 mechanically ventilated patients assigned to semi-recumbent position or supine body position. The trial demonstrated that confirmed cases of VAP were 23 percent in the supine group while in the semi-recumbent position it was 5 percent (p=0.018).

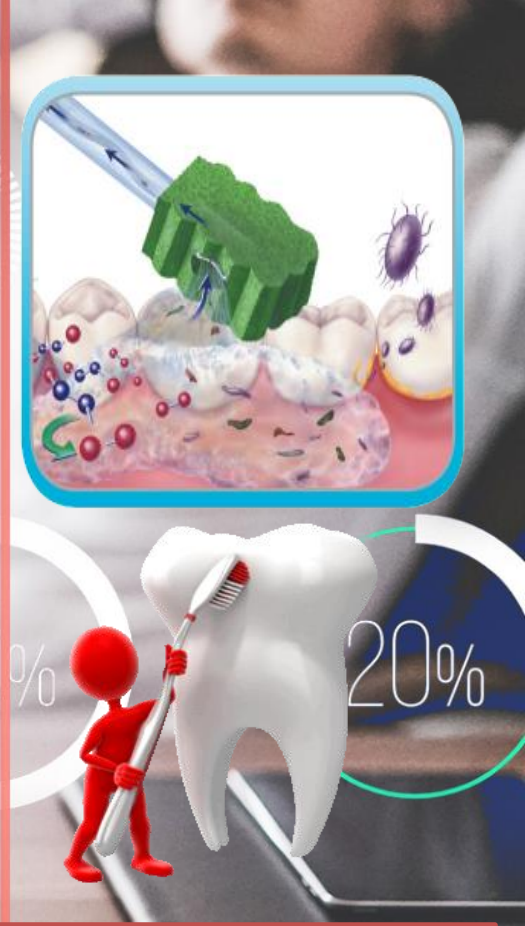
2. Daily “Sedation Vacations”

- It appears that lightening sedation decreases the amount of time spent on mechanical ventilation .
- In addition early weaning from ventilator and extubation becomes easier and quicker and patients are able to participate and cooperate with physiotherapists and nurses in coughing out secretions and mobilizing out of bed.
- These attributes would help in preventing VAP.

Kress et al conducted a randomized controlled in 128 adult patients on mechanical ventilation , daily interruption resulted in a marked and highly significant reduction in time on mechanical ventilation. The duration of mechanical ventilation decreased from 7.3 days to 4.9 days (p=0.004)

3. Daily Oral Care With Chlorhexidine

- Dental plaques develop in patients that are mechanically ventilated because of lack of chewing and absence of saliva.
- Dental plaques are covered by a biofilm which are colonized by bacteria, which can be aspirated resulting in VAP.
- A meta-analysis of eleven studies concluded that oral decontamination of mechanically ventilated patient with chlorhexidine is associated with a lower incidence of VAP. **The recommended chlorhexidine solution strength is 0.12%**.

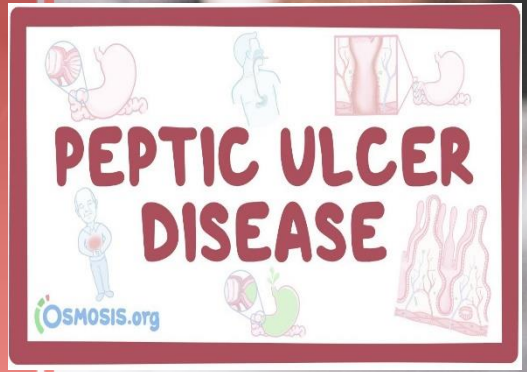


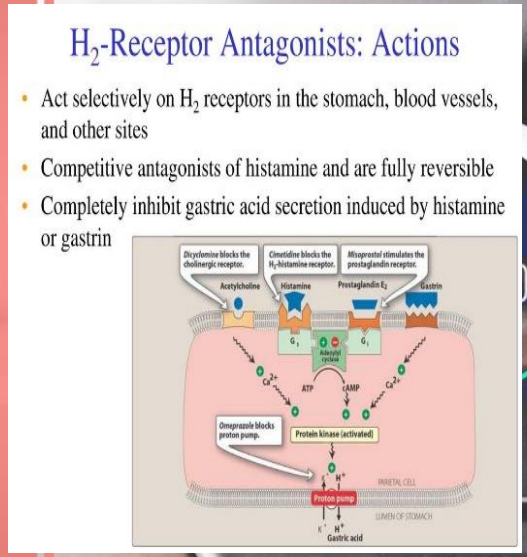
Munro CL, Grap MJ, Jones DI, McClish DK, Sessler CN. Chlorhexidine, tooth brushing and preventing ventilator-associated pneumonia in critically ill adults. American Journal of Critical Care 2009; 18:428-437.

4. Peptic Ulcer Disease Prophylaxis

- Stress induced gastrointestinal erosions and ulcers with bleeding are a common occurrence in sick group of ICU population in general and ventilated patient in particular. These groups of patients should be put on routine stress ulcer prophylaxis.

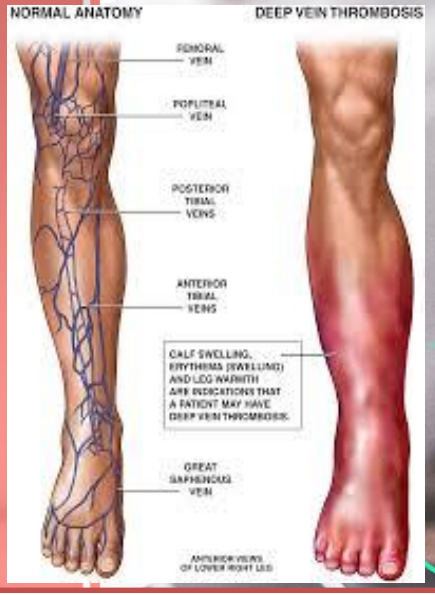
- **H2** receptor blockers are more efficacious than sucralfate and are the preferred agents.





5. Deep Venous Thrombosis Prophylaxis

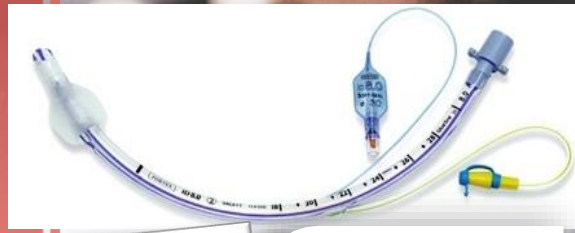
- Ventilated patients are at a high risk of developing deep venous thrombosis (DVT) and its complications due to immobility. The risk of DVT is decreased if applied consistently according to guidelines.



Geerts WH, Pineo GF, Heit JA, et al Prevention of Venous Thromboembolism: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (8th Edition). Chest 2008 133:6 suppl 381S-453S

6. Other Elements Considered are :

- Condensate emptying from the ventilator circuit
- Endotracheal tube cuff pressure at 20 cm water (once per shift)
- Subglottic aspiration/suction done



- Subglottic Secretion drainage reduced the duration of mechanical ventilation by 2 days (95% CI 1.7–2.3) and length of the ICU stay by 3 days (95% CI 2.1–3.9).(Dezfulian C, Shojania K, Collard HR, et al.,2005)
- In an observational study of separate periods of circuit changes every 2 days, 7 days or 30 days, the highest VAP rate occurred at 2 days and the lowest at 7 days. (Fink JB, Krause SA, Barrett L, et al.,2008)

GOVERNMENT OF DUBAI

Ventilator-Associated Pnemonia (VAP) Bundle

DUBAI HEALTH AUTHORITY

Dubai Hospital
Intensive Care Deptartment

Patient's Name:
Health Card No. DOB:

Clinical Area

Bundle Components ↓	Date →																				
	Shift →	M	A	N	M	A	N	M	A	N	M	A	N	M	A	N	M	A	N	M	A	N
1. Elevation of head of bed 35º - 45º (throughout the day)		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	⊏	☐	☐	☐	⊐	☐	☐
2. Sedation Break and assessment of readiness for weaning (once per day)			☐			☐			⊏			☐			☐			☐			☐	
3. Peptic ulcer disease prophylaxis (including proton pump inhibitor or H_2 antagonist or sucralfate)		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	⊏	☐	☐	☐	⊐	☐	☐
4. DVT prophylaxis – either Drug 'D' or mechanical (intermittent compression device) 'M'		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	⊏	☐	☐	☐	⊐	☐	☐
5. Condensate emptied from the ventilator circuit		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	⊏	☐	☐	☐	⊐	☐	☐
6. Chlorhexidine mouth wash (2hrly)		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	⊏	☐	☐	☐	⊐	☐	☐
7. Subglottic aspiration/suction done		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	⊏	☐	☐	☐	⊐	☐	☐
8. Endotracheal tube cuff pressure at 20cm H_2O (once per shift)		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	⊏	☐	☐	☐	⊐	☐	☐
Nursing Staff Initials →																						

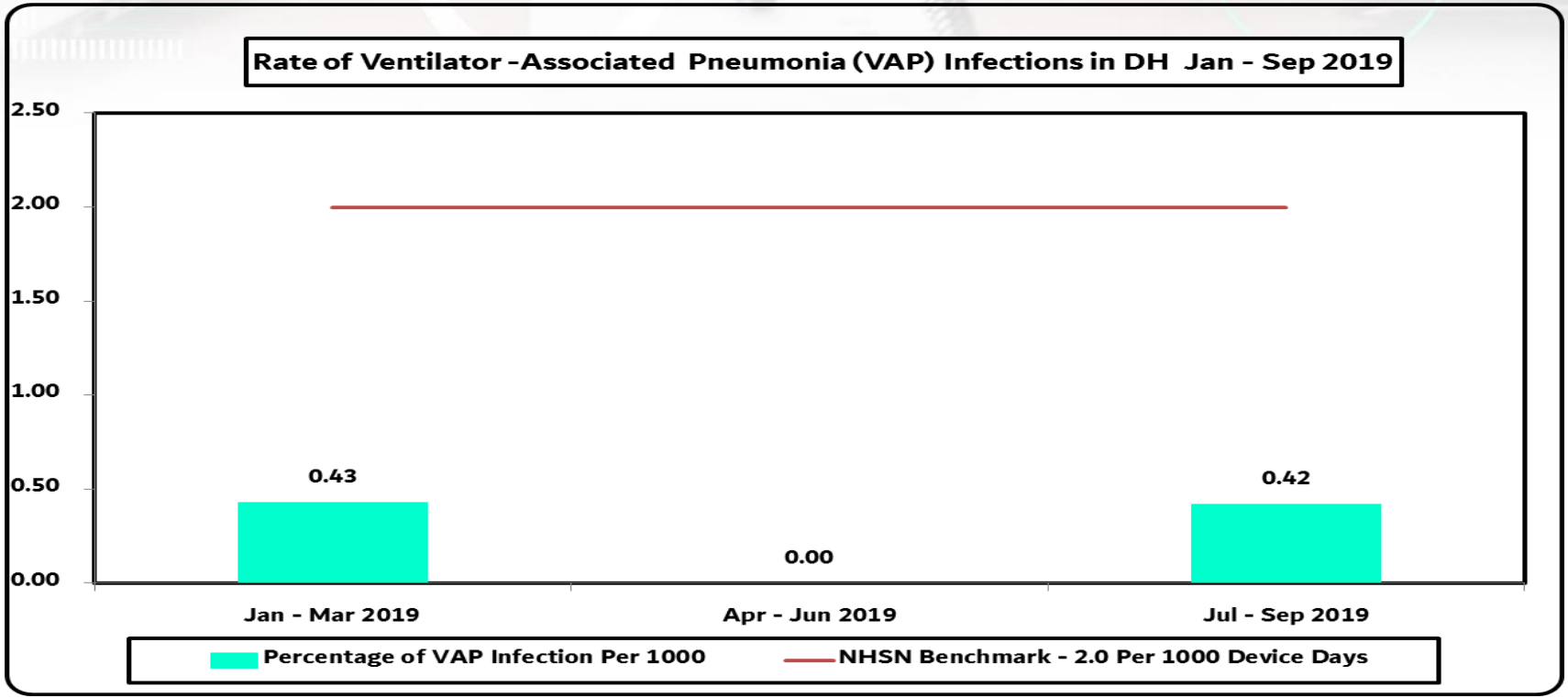
Please ☑ if 100% Bundle Compliant Please ☒ if not implemented (Requires justification below)

NB. For Bundle No. 7 - If the endotracheal tube used without the subglottic suction line indicate as 'NA' (not applicable).

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

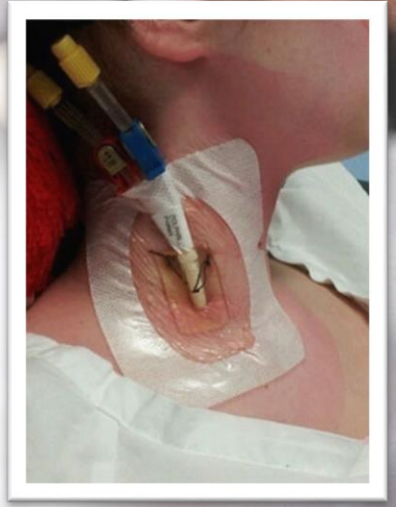
Please Note: This audit tool is not part of the medical record. Store this form in the designated folder after completion.

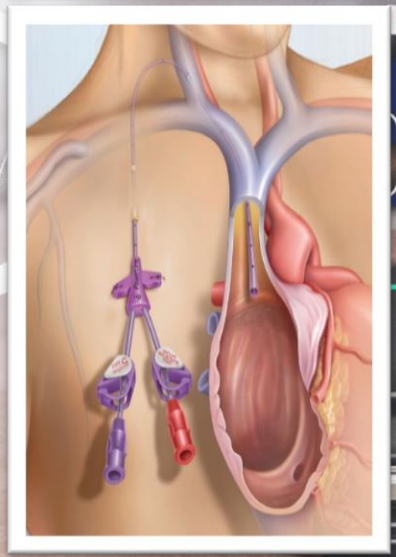
Revised – Feb. 2014


Rate of Ventilator -Associated Pneumonia (VAP) Infections in DH Jan - Sep 2019
2.50
2.00
1.50
1.00
0.50
0.00
0.43
0.00
0.42
Jan - Mar 2019
Apr - Jun 2019
Jul - Sep 2019
Percentage of VAP Infection Per 1000
NHSN Benchmark - 2.0 Per 1000 Device Days

2. CENTRAL LINE BUNDLE

- Approximately 48% of ICU patients have central venous catheters (CVC) and majority of catheter related blood stream infections (CRBSI) are due to the use of CVC.
- Attributable mortality for these infections is around 20%.





The key components of a Central Line Bundle are :

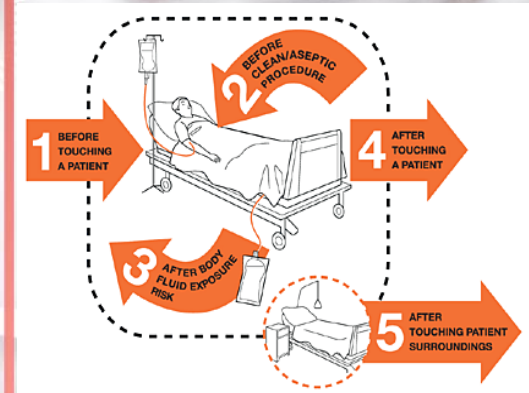
1. Hand Hygiene

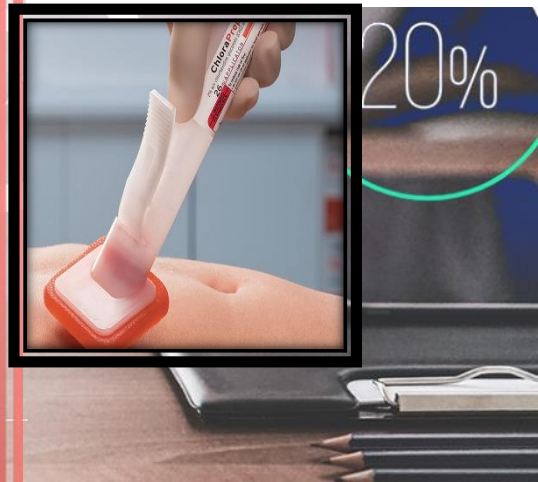
Proper compliance with hand hygiene procedures by all health care workers reduces incidence of all nosocomial infections and particularly of CLABSI.

2. Use of PPE : Maximum Barrier device to be used.

3. Chlorhexidine skin antisepsis

Use of **2% chlorhexidine** in **70% Isopropyl Alcohol** is an essential component for preventing CLABSI. It provides better antisepsis than Povidone-Iodine solution. Allow antiseptic solution to dry for two minutes before puncturing the skin.





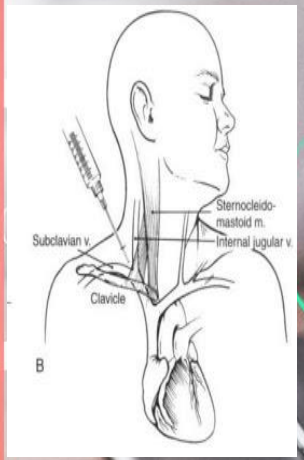
The key components of a Central Line Bundle are:

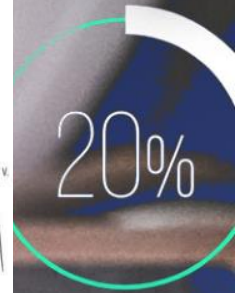
4. Optimal catheter site selection

Avoidance of the **Femoral Vein** for central venous access in adult patients.

Whenever possible the femoral site should be avoided and **Subclavian Site** should be preferred over jugular for line insertion in adults.

5. Proper Skin Preparation





Central Line Components

- Does patient need the central line in place? Ask the attending physician for indication.
- Intact clean dressing change every seven days.
- Insertion site assessed for redness, swelling, discharge and tenderness.
- Chlorhexidine Gel transparent dressing intact.

Central Line Bundle

GOVERNMENT OF DUBAI

DUBAI HEALTH AUTHORITY

Dubai Hospital
Intensive Care Department

Patient Name:		Clinical Area:
Health Card No.	DOB:	

Central Line Insertion – Check List	Done ✓	Not Done *	IF Not done/justify
Indication for Central Line documented in patient's notes?			
Proper hand hygiene done by both operator and assistant?			
Maximum barriers during insertion? i.e. use of mask, sterile gloves, gowns and sterile drape?			
Preferred Central Line insertion site is subclavian; if other access used provide justification.			
Proper skin preparation used? (Chlorhexidine 2% with alcohol 70% & let it dry for at least 2 min.)			
Chlorhexidine Gel transparent dressing applied?			

Date of insertion: Inserted by: Supervised by:

If a central line was inserted out of your clinical area /indicate location: Date of insertion:

Bundle Components ↓	Date →																				
	Shift →	M	A	N	M	A	N	M	A	N	M	A	N	M	A	N	M	A	N	M	A	N
1. Does patient need the central line in place? Ask the attending physician for indication.		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2. Intact clean dressing change every seven days?*			☐			☐			☐			☐			☐			☐			☐	
3. Insertion site assessed for redness, swelling, discharge and tenderness?		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4. Chlorhexidine Gel transparent dressing intact?		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Nursing Staff initials →																					

Please ☑ if 100% bundle compliant Please ☒ if not implemented (Requires justification below) If central line removed document removal date:

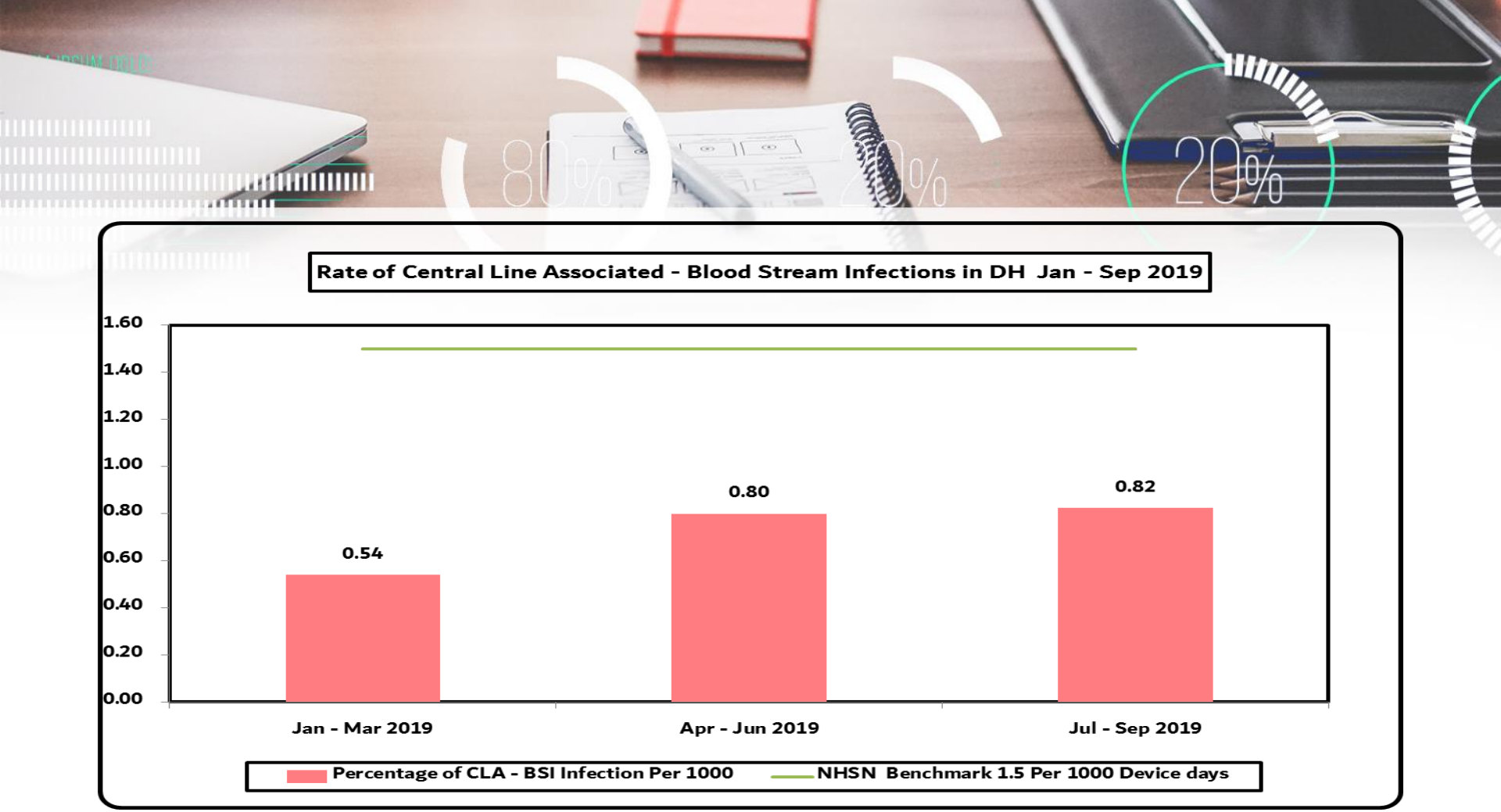
*If central line dressing changed before completing the seventh day, (e.g. due to loose/damp/moist dressing), mark ☑ in designated area and justify below.

1. _____
2. _____
3. _____
4. _____

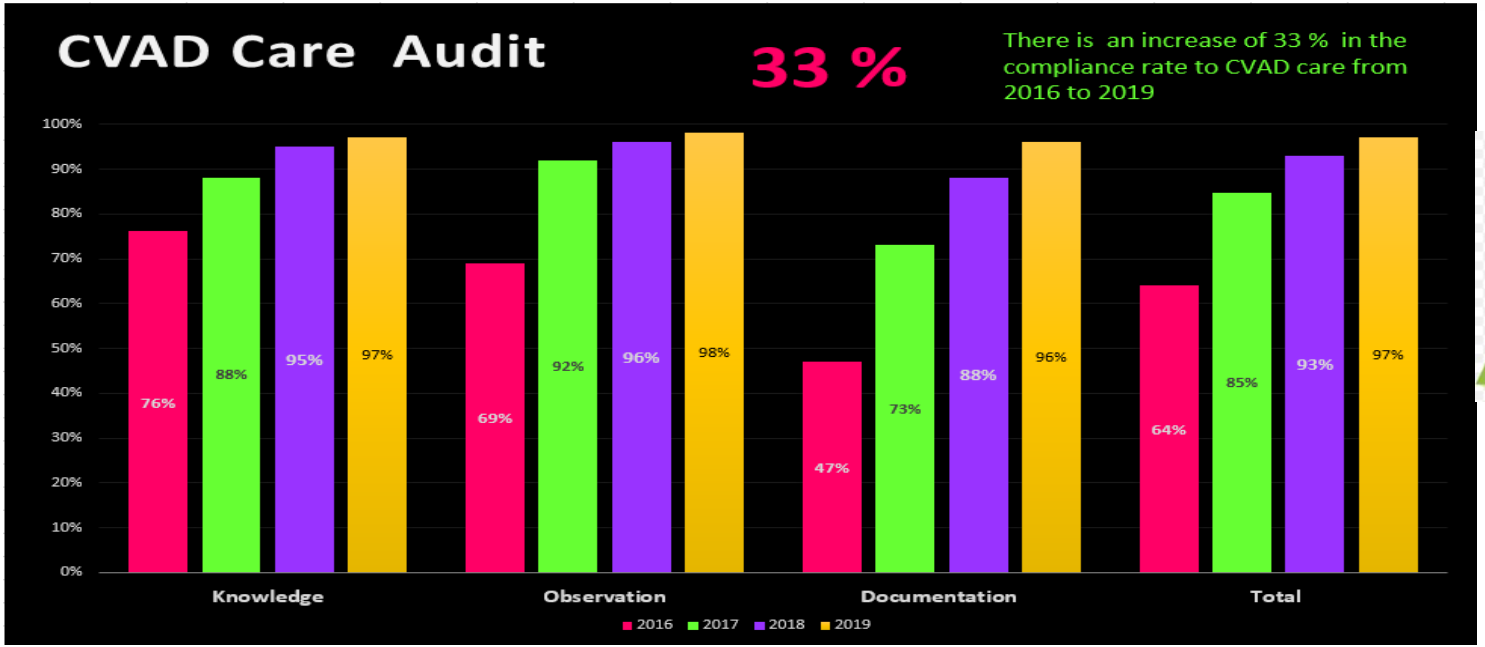
NB.1- Exposure of central line dressing for assessment must be done only if needed.
NB.2- Gauze dressing to be used temporarily for oozing central line insertion site.

Please Note: This audit tool is not part of the medical record. Store this form in the designated folder after completion.

Revised Feb. 2014


Rate of Central Line Associated - Blood Stream Infections in DH Jan - Sep 2019
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.54
0.80
0.82
Jan - Mar 2019
Apr - Jun 2019
Jul - Sep 2019
Percentage of CLA - BSI Infection Per 1000
NHSN Benchmark 1.5 Per 1000 Device days

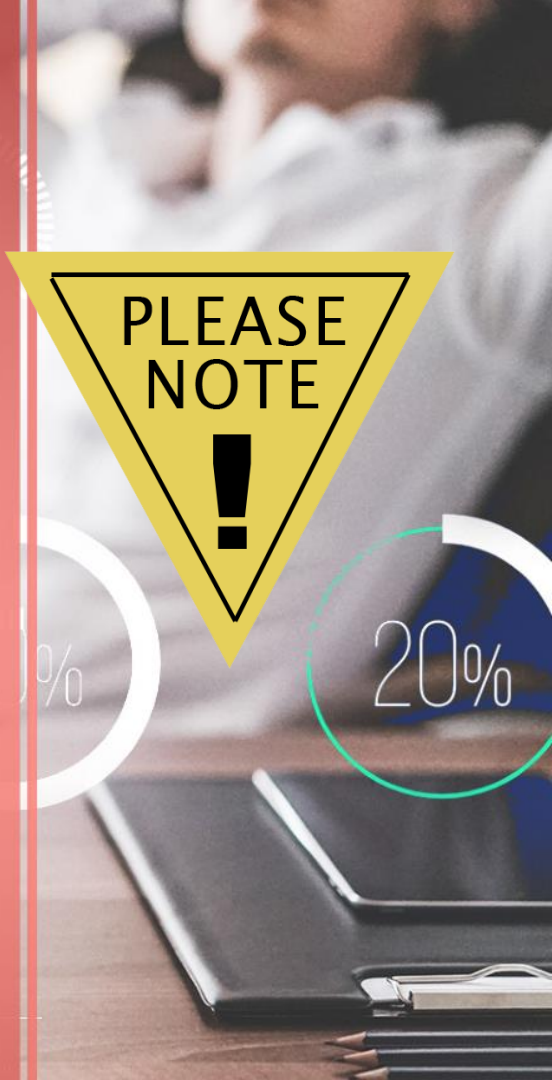
Compared CVAD compliance rate from 2016 to 2019



3. Urinary Catheter Bundle

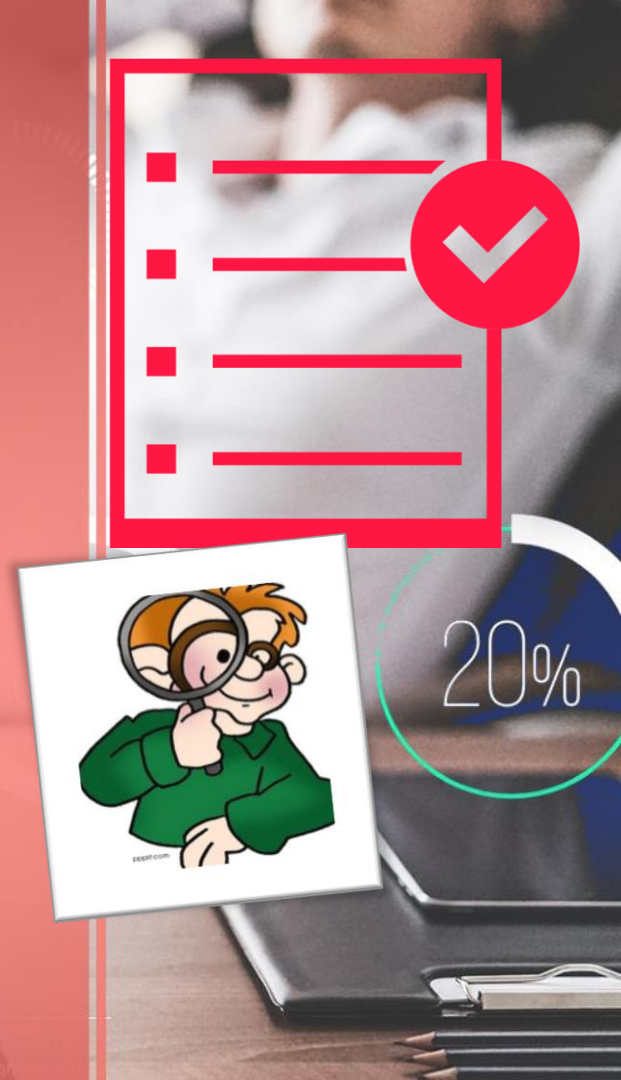
a. Insertion Checklist:

- **Indication** for urinary catheter documented in patient's file
- **Compliance** with proper hand hygiene
- **Use of mask**, gloves, gown, drape and packet of single use lubricant jelly
- **Urine allowed to drain** before catheter balloon inflated



b. Maintenance Care Checklist

- Drainage bag properly placed lower than patients bladder
- Does patient need the urinary catheter in place? Ask the attending physician for indication
- Urinary catheter secured to the patient's leg.
- Urinary collection bag secured below the bed and off the floor



GOVERNMENT OF DUBAI

Urinary Catheter Care Bundle

DUBAI HEALTH AUTHORITY

Dubai Hospital
Intensive Care Deptartment

Patient's Name:	Clinical Area:
Health Card No. DOB:	

Urinary Catheter Insertion - Check List	Done ✓	Not done ✗	IF Not done/justify
Indication for urinary catheter documented in patient's file?			
Compliance with proper hand hygiene?			
Use of mask, gloves, gown, drape and packet of single use lubricant jelly?			
Urine allowed to drain before catheter balloon inflated?			

Date of insertion: Inserted by: Supervised by:

If the urinary catheter was inserted out of your clinical area, indicate location: Date of Insertion:

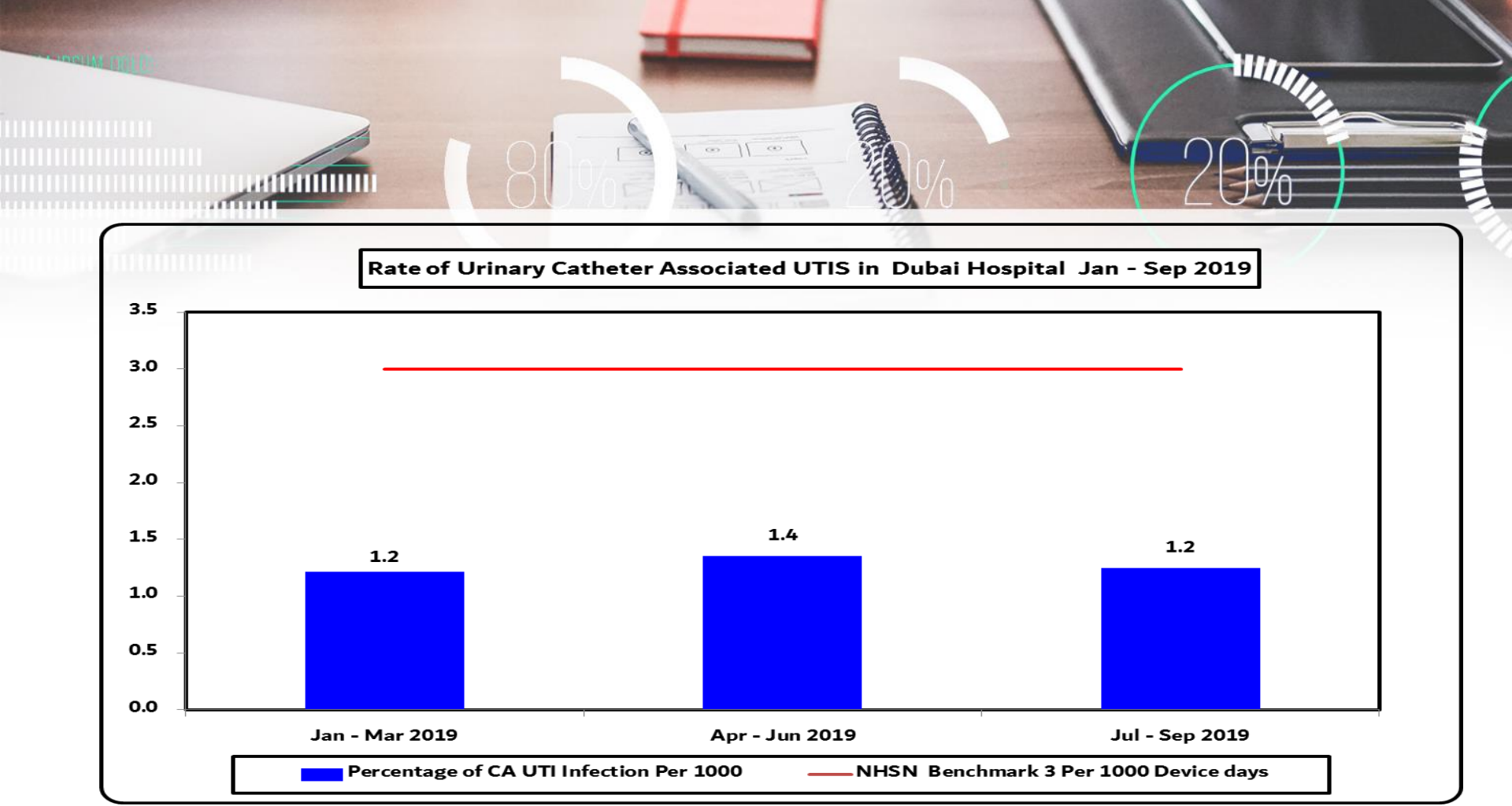
Bundle Components ↓ / Date → / Shift →	M	A	N	M	A	N	M	A	N	M	A	N	M	A	N	M	A	N	M	A	N
1. Drainage bag properly placed lower than patients bladder	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	⊏	☐	☐	☐	⊐	☐	☐
2. Does patient need the urinary catheter in place? Ask the attending physician for indication.		☐			☐			⊏			☐			☐			☐			☐	
3. Urinary catheter secured to the patient's leg.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	⊏	☐	☐	☐	⊐	☐	☐
4. Urinary collection bag secured below the bed and off the floor	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	⊏	☐	☐	☐	⊐	☐	☐
Nursing Staff Initials →																					

If any of the small boxes as ☒ provide your justification below.

1. _____
2. _____
3. _____
4. _____

Please Note: This audit tool is not part of the medical record. Store this form in the designated folder after completion.

Revised Feb. 2014


Rate of Urinary Catheter Associated UTIS in Dubai Hospital Jan - Sep 2019
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1.2
1.4
1.2
Jan - Mar 2019
Apr - Jun 2019
Jul - Sep 2019
Percentage of CA UTI Infection Per 1000
NHSN Benchmark 3 Per 1000 Device days

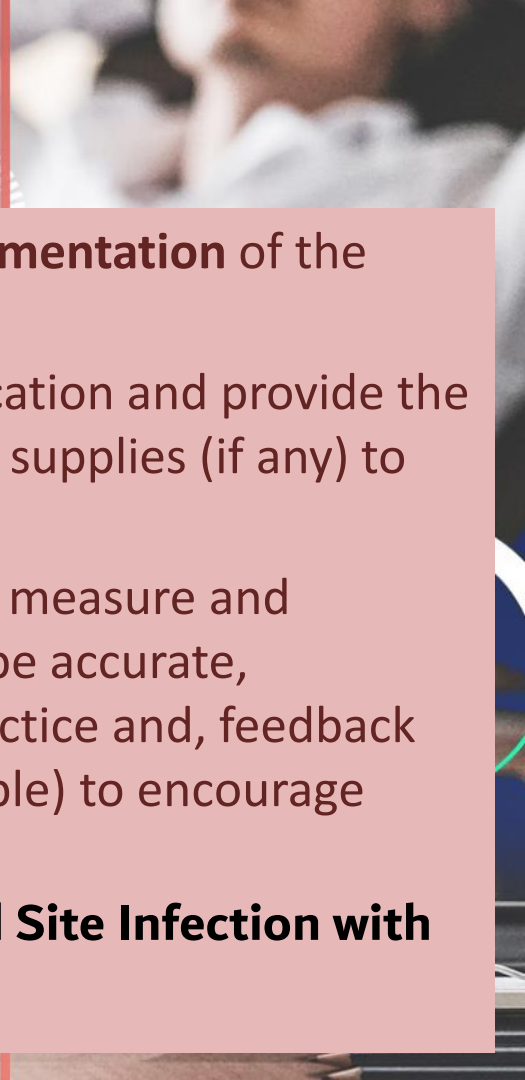
Conclusion and Summary

- Bundles of Care are described as best group of **evidence based practice interventions**.
- The theory behind these bundles is that when **several evidenced based interventions are grouped together** in a single protocol, it will improve patient outcome.
- These bundles are **relatively easy to develop, implement and audit**.

Recommendations

- Depending on the **local hospital setting** these evidence-based infection prevention bundles can be i**mplemented**.
- Ensure the **elements of the care bundle are concise, simple, and prescriptive** since numerous, complex bundle elements may hinder the success and effectiveness of frontline adoption and implementation.
- Bundle **elements should not be static**, but must adapt to changing evidence and best practices as new evidence emerges.
- **Obtain approval**, commitment, and endorsement from hospital leadership, clinicians, nursing staff, and other members of the healthcare team. Be clear on the purpose and collective goal of the desired process and communicate this message.

Recommendations



- Identify members of the healthcare team to **test the implementation** of the proposed bundle elements.
- **Create awareness** through the necessary training and education and provide the team with the applicable guidelines, evidence, toolkits and supplies (if any) to execute the implementation of a bundle.
- **Track compliance** to the care bundle as an "**all or nothing"** measure and feedback results to frontline teams. Measurement should be accurate, consistent and ongoing to authentically reflect hospital practice and, feedback should be delivered frequently (weekly or monthly if possible) to encourage improvement and sustainability.

Note: Now we working on implementing bundle for Surgical Site Infection with 7 S Bundle.

7 S Bundle

1. **S**afe operating room practices
2. **S**howers with chlorhexidine
3. **S**creening for MRSA and methicillin-susceptible *Staphylococcus aureus* (MSSA)
4. **S**kin preparation with alcohol-based antiseptics
5. **S**utures containing an antimicrobial
6. **S**olution with chlorhexidine for irrigation
7. **S**kin adhesive and/or antimicrobial dressings to protect the incision

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THANK YOU !