Target CLAB ZERO
Central Line Associated Bacteraemia

National Collaborative

To Prevent Central Line Associated Bacteraemia

October 2011 to April 2013

Maintenance Bundle Literature Review

HEALTH QUALITY & SAFETY COMMISSION NEW ZEALAND
Kupu Taurangi Hauora o Aotearoa

KO AWATEA
APPLIED HEALTHCARE INNOVATION

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1. Purpose

The purpose of this document is to outline the current status in relation to the Maintenance bundle, include what has been achieved nationally and learn from the work that has been done internationally.

2. Background

Over the period of the introduction of the maintenance bundle Project Leads and Clinical Leads have expressed various concerns in relation to the monitoring, recording and reporting of the compliance to the maintenance bundle:

- Time it takes to develop systems that enable staff to collect the data
- The perception that the work is being done but not being recorded
- The reliance on "a person" to ensure that the checklist documentation is completed
- That it is not an observed process and relies on documentation

The maintenance bundle consists of four key areas:

- Daily necessity review
- Dedicated port for TPN
- Daily site check
- Chlorhexidine prior to each access.

This is a measure of how well the team is adhering to the bundle of care (formatted into the checklist). Although the checklist itemizes the individual components of the bundle, the measure is whether the entire bundle has been implemented each time – an 'all or nothing' indicator. If even one element is missing then the case is not in compliance with the bundle. Separate measures for Insertion Checklist and Maintenance Checklist compliance are calculated.

This measure can either be done as a random sample of checklists, or all checklists can be assessed (this is easier if the data is being entered into a central database). For example: If there are 7 patients with central lines, and 6 have all elements of checklist completed, then compliance = 6/7 x 100 = 86%

Compliance with checklist = no. with all elements of bundle completed

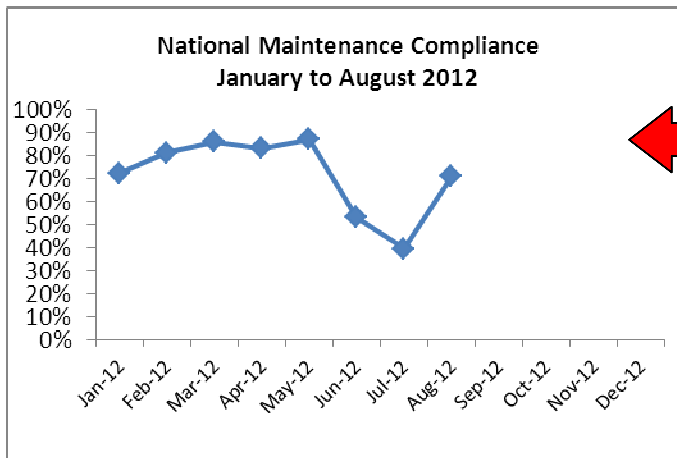
This requires that the first three components are recorded daily and the fourth component, access of the line recorded on each shift. Compliance with the chlorhexidine prior to each access requires each shift to tick the box to indicate that they "scrubbed the hub" with chlorhexidine prior to each access on that shift.

The operational data definitions for the maintenance bundle are as follows:

Operational Definition	Data Collection Guidance
1. Determine the numerator: the total number of line days that are compliant with all 4 elements of the CVL maintenance bundle. i.e There may be multiple days for one line and each day should be counted as a separate entity. 2. Determine the denominator: the total number of line days for the period reviewed. The same applies as above 3.Calculate the percent compliance with the central line maintenance bundle by dividing the numerator by the denominator and then multiplying the resulting proportion by 100 This can be a random sample, or all line days. Any line day that is not compliant with all the elements of the maintenance bundle means that compliance for that day is not achieved. Note the CL Maintenance bundle includes (1) Review of necessity (2)Dedicated port for TPN (3) Daily site check for inflammation (4) chlorhexidine ***prior to each access*** and should be documented at the end of each shift to confirm that the "hub was scrubbed" at every access on that shift. (8r shifts require 3 ticks, 12hr shifts require 2 ticks)	Maintenance Bundle optimal criteria includes: • Daily checking and recording of the need for a CVL • Dedicated port for TPN when applicable • Daily site check for inflammation • Chlorhexidine prior to each access For those DHBs that have more than 100 CVL's per month, a sample of the lines under review can be done. The aim is to achieve review of at least 5 charts per week. The method to be used is the Simple Random Sample; using excel random sample generator, enter your number of observations and ask for the number of random numbers that allows review of at least 20 charts. i.e 100 charts (observations) ask for 20 random numbers. Check those 20 charts (observations) Only days with all elements of CL bundle adhered to are recorded as being compliant. Report monthly to the IHI Extranet but report each week's prevalence. This means that there should be 4 data points for each month unless the volume is low (e.g., some weeks there are no CVLs in place) in which case the results for all CVLs for the month will need to be aggregated.) Note: if a patient is not eligible for one of the bundle elements for medical reasons and that exclusion is documented, that patient is considered compliant for that element of the bundle.

3. Current Status

ALL DHBs	**Jan '12**	**Feb '12**	**Mar '12**	**Apr '12**	**May '12**	**Jun '12**	**Jul '12**	**Aug '12**
Line Days Reviewed	152	461	649	806	773	1264	1767	1196
Line Days Compliant	191	558	764	949	927	2454	4446	1684
COMPLIANCE RATE	**80%**	**83%**	**85%**	**85%**	**83%**	**52%**	**40%**	**71%**



There is a notable increase in the national percentage compliance to the maintenance bundle following the challenging results in July. This increase appears to be largely attributed to the work that has been put in by the teams to increase the actual recording of the compliance as opposed to necessarily an improvement in actual compliance to the components of the maintenance bundle.

Currently 20 units are reporting on their maintenance bundle compliance. Various approaches have been used and tested and this section will highlight some of the successes.

Northern Region

CMDHB

As reflected in the How to Guide, CMDHB have developed a data base that is able to capture all the measurement parameters for this initiative. Having started with a manual system the staff found the data base eased the workload and added to the reliability of the reporting

To embed the process the Charge Nurse Manager has a checklist of all the daily documentation requirements of which CLAB maintenance bundle compliance is one of them. Filling out the form is part of the work, not an extra, not an "add on" but just part of the routine. On the night shift the Charge Nurse for the night does a check during the shift in conjunction with other checks that she has on her checklist. This works as a constant reminder to all staff of the importance of all areas of documentation including the maintenance bundle.

Key Success factor
Making compliance to the maintenance bundle part of "Business As Usual" and routine work

Auckland DHB ICUs – PICU, DCCM, CVICU

The three ICUs at Auckland have opted to do simple random sampling. ADHB review 20 line days per week in each ICU unit and assess the compliance with the maintenance bundle for those 20 days. This is working well and can be completed in a reasonable timeframe. It identifies the issues that need to be addressed – usually the absence of documentation. We do not have a database but record the information on a form that the team has developed using a number of PDSA cycles.

This information will soon be recorded on a spreadsheet developed by the decision support unit.

Waitemata DHB

At WDHB the checklists for the insertion and maintenance bundles on a yellow form and the information collated by the Project Lead, who also works as a Registered Nurse on the unit.

Key success factor
Having a bright yellow checklist form as part of the patient's notes

The insertion bundle trolley has the yellow insertion/maintenance checklist on the trolley with the insertion pack

Southern Region
Canterbury DHB
Christchurch Hospital started with the development of stickers in the patients files but found that this was difficult to follow up and do the weekly counts. They have since developed a data base for the insertion and maintenance bundle component compliance. Initially the collection of the maintenance bundle data was extremely labour intensive compounded by difficulties with the data base. The data base would default to zero percentage compliance if not entered daily. Concerns were raised by the Clinical Lead as to the time being spent on trying to determine the best processes for data collection of the maintenance bundle and detracting from actually improving the care delivered. Like a number of DHBs there was a sense that the work was being done but the recording was not and that the percentage compliance to the maintenance bundle did not reflect what was actually happening.

As demonstrated in the September data Christchurch Hospital are collecting all maintenance lines in the ICU. Their compliance has improved as the issues with the data base are resolved and the staff education continued.

Key to improvement
Development of the data base not withstanding the speed with which it was put together and the teething problems, this has been a positive initiative.

Central Region
Wellington Hospital

The team are introducing FASTCHUG a Visual ward round audit prompt. The "C" is new and represents CVL

Hutt Valley
Hutt Valley may introduce a "Point Prevalence: audit whereby the Nurse is asked whether or not the four components in the Maintenance bundle had been followed. This would be a good PDSA small cycle of improvement to test

The remainder of the DHBs are doing variations of the methods described above.

3. Literature Review

The literature suggests unanimously that the need for the monitoring and recording of compliance to the Maintenance bundle/Care bundle is essential. This section will cover what other places around the worlds have done in relation to monitoring and recording their compliance percentages.

Canada

Reference: www.saferhealthcarenow.ca

This section highlights the approach to the maintenance/ central line care bundle in Canada On a given day, select all the patients with central lines and assess them for compliance with the central line care bundle, ensuring all identified components have been completed. Safer Healthcare Now recommends that before your facility, team or unit begins implementing the intervention, you obtain baseline data, using the worksheets provided. Baseline data will give you a sense of where you are starting from, and what some of the potential areas of focus are for your facility or unit. We suggest that you take a "snapshot" of three months or more, or whatever is feasible for your organization.

The team were encouraged to start small, one patient, and one nurse, identifying opportunities to improve the process and when agreed to roll this out to more nurses on the same shift, then to different shift, making sure that the process works across multiple settings. The staff are encouraged to engage in further PDSAs to refine their local process. This refinement continues to a point of agreement on the process to be implemented.

The barriers encountered were similar to those encountered across our DHBs and included:

- **Fear of change**. All change is difficult. The antidote to fear is knowledge about the deficiencies of the present process and optimism about the potential benefits of a new process.
- **Communication breakdown.** Organizations have not been successful when they failed to communicate with staff about the importance of central line care, as well as when they failed to provide ongoing teaching as new staff become involved in the process.
- **Physician and staff "partial buy-in"** (i.e. "Just another flavor of the week?") In order to enlist support and engage staff, it is important to share baseline data on CLAB rates and to share the results of improvement efforts. If the area already has a low rate or in the cases of the NZ units reporting zero it is important to refocus on the goal of best practice to prevent infections and consequently decrease risk to the patient is suggested as helpful motivator.

Tips for Gathering Data

- Include daily review of line necessity a part of the multi-disciplinary rounds and/or CNM round
- Include assessment for removal of lines as part of the daily goals sheet
- Record date and time of line placement to assist staff in their evaluation and decision making.
- In terms of using chlorhexidine to "scrub the hub" eliminate choice
- Provide education
- Include checking of the insertion site as part of the daily goals or care sheet check
- Some teams have use a sampling method where they do spot checks of compliance three times per week and others daily assessments of compliance at designated times.

Attached as Appendix 1 is a Sample of Daily Goals Sheet

Northern Ireland Regional Infection Control Manual

http://www.infectioncontrolmanual.co.ni/index.php?option=com_content&view=category&id=137&Itemid=119

In the Northern Ireland manual the recommendation is that the care bundle will support cycles of review and continuous improvement which will deliver appropriate and high quality patient care.

They implemented an electronic tool that collected, collated and produced different views of the data.

They put in an audit process for measuring the compliance. Audits are carried out regularly at the point of care. Results can be collected electronically or manually and should be carried out by peers

4. Conclusion

There are key factors that need to be considered when implementing the maintenance bundle and developing the processes for the collection, recording and reporting of the data.

- Data collection should be made as simple as possible but robust enough to comply with the operational data definitions
- If doing sampling it is important to get a representative sample of what is occurring. Bob Lloyd from the IHI suggested that when there are in excess of 300 line days a month then a sample of 20 per week would give a good indication of the percentage compliance to the maintenance bundle. If you only have small numbers of lines it is preferable to review every line compliance to the maintenance bundle.
- Education needs to include why as well as the what. Staff need to understand why it is necessary to record their management of the CVL
- The care of the CVL, the recording and reporting should as far as possible be incorporated in Business As Usual. e.g. use a daily checklist; daily goals sheet
- Improvement cannot occur if it is not documented/in a data base and the results recorded over time.
- Weekly data is preferable as it allows for cycles of improvement to be put in place when a problem is identified.
- Observation of the compliance to the maintenance bundle checklist has been suggested by some DHBs as an option. This will need to be tested. An audit tool done on a weekly basis may support this approach. Currently the compliance is ascertained by reviewing the checklists after the procedure has been completed.

References

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http://www.ipro.org/index/cmsfilesystemaction/hai/pe/webex/02142012.pdf

http://webarchive.nationalarchives.gov.uk/20120118164404/http://hcai.dh.gov.uk/files/2011/03/2011-03-14-HII-Central-Venous-Catheter-Care-Bundle-FINAL.pdf

If you have good ideas that have worked well in your DHB and are not documented please respond to "all" and let us know what is working for you.

Appendix C: Sample Daily Goals

ICU Daily Goals

Patient Name ________________

Room Number ________________ Date____/____/_____

---Initial as goals are reviewed ----

GOAL	NOTES	0700 - 1500	1500 - 2300	2300 - 0700
What needs to be done for the patient to be discharged from the ICU?				
What is this patient's greatest safety risk?				
Central line insertion bundle				
• Hand hygiene				
• Maximal barrier precautions				
• Chlorhexidine skin antisepsis				
• Optimal catheter site selection				
Central line care bundle				
• Daily review of line necessity				
• Accesstic lumen access				
• Catheter site and tubing care				
Cardiac Rhythm, Hemodynamics				
Volume Status, net goal for next 8 - 12 hrs				
Neuro: Pain Mgt/Sedation				
GI: Nutrition /Bowel Regimen				

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GOAL	NOTES	0700 - 1500	1500 - 2300	2300 - 0700
Mobilization / Out of Bed / Stroll				
ID: Cultures, Drug levels				
Medication changes (can any be stopped?)				
Tests/Procedures				
Review scheduled labs. Can any be D/C?				
Morning labs, CXR				
Any catheters/tubes be D/C?				
Skin Care Addressed?				
Consultations				
Referring Physician updated?				
Family Updated?				
Social issues to address?				
Emotional/spiritual issues?				
Code Status Addressed?				
Advanced Directive in place?				
Parameters for calling MD				

*Adapted from the Johns Hopkins University Quality & Safety Research Group Tool Kit

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