

STANFORD
HOSPITAL & CLINICS
Stanford University Medical Center

**The Cost of the Blood Draw:
How to Best Manage the BMT
Patient?**

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OBJECTIVES

THE COST OF THE BLOOD DRAW: HOW TO BEST MANAGE THE BMT PATIENT?

- Discuss guidelines and standards of care that impact vascular device maintenance and blood sampling.
- Review the impact of blood sampling and its effect on the BMT patient.

WHAT REQUIRES A BLOOD DISCARD OR BLOOD DRAW?

- Daily labs
- Point of care
- Drug levels
- Research labs
- Pharmacokinetics
- Blood cultures
- Checking blood return

PRACTICES TO AVOID: *USE OF CVCs FOR BLOOD SAMPLING.*

This practice increases the number of catheter manipulations at the catheter hub, thereby increasing the risk for contamination. It also increases the risk of catheter occlusion if not adequately flushed immediately after the sample has been withdrawn.

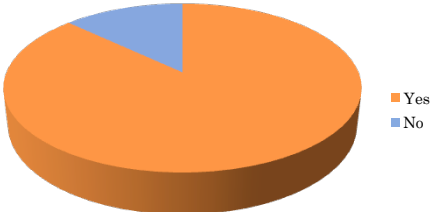
- Daily labs
- Point of care
- Drug levels
- Research labs
- Pharmacokinetics
- Blood cultures
- Checking blood return

RISK VERSUS BENEFIT

<u>Risk</u>	<u>Benefits</u>
○ Occlusion	○ Avoidance of anxiety, discomfort and dissatisfaction with venipuncture
○ Catheter related blood stream infection	○ Results of the lab sample
○ Potential for inaccurate lab results	
○ Anemia	

87% TRANSFUSE RBCs FOR A SPECIFIC NUMERICAL VALUE

Q9. As a standard, does your institution transfuse RBCs for a specific numerical value?

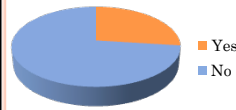


Response	Percentage
Yes	87%
No	13%

METHODS OF BLOOD DRAW

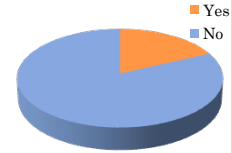
- Discard
- Push-pull (mixing)
- Reinfusion
 - Closed system blood draw

Q6. Does your institution use a closed needle free in line blood sampling system which allows for blood discard to be reinfused for laboratory samples



27% answered yes to using a closed needle free In line blood sampling system

Q7. If Yes is this for ICU BMT patients?



18% answered yes this is for ICU BMT patients

Journal	Purpose	Results	Comments
Ciccolini, G. et al (2011) Journal of Clinical Nursing, 21 281-284	Aim to compare blood samples by direct venipuncture vs CVC with a 5ml or 10ml wasted blood	Both 5ml and 10ml blood waste or direct venipuncture can be used as discard.	20 patients. Laboratory data used: glucose, alk phos, SGPT, bili, amylase, platelets...
Wyant, S. & Crickman, MN. (2012) CJON, 16, (5)	Determining the minimum discard volume for central venous catheter blood draws.	Optimal discard volume to avoid dilution or contamination sampling is 9ml from tunneled catheters and 6ml from nontunneled catheters. Standardized checklist eliminated blood redraws.	93 adult patients. Lines flushed with dextrose, waited 30 seconds then 4 3ml tubes were sequentially drawn using vacutainers.
Adland, K., (2008) Journal of Pediatric Hematology/Oncology	Test the limits of agreement between laboratory values obtained using the push pull and standard methods of blood sampling from CVADs in pediatric oncology	The laboratory values of the research samples obtained using the push-pull method and the control values had an extremely high degree of agreement. No hemolysis evidence by K levels. No hemodilution as evidence of HCT levels.	30 pediatric oncology patients with tunneled or implanted CVADs conveniently enrolled. Used standardized procedure for obtaining paired specimens.
Barton, SJ et al. (2004) Journal of Pediatric Oncology Nursing	Test the agreement in blood values obtained from a discard method and a push pull method in samples from CVC in pediatric patients.	Push pull method of obtaining blood specimens from pediatric CVC should be considered. 96% of measured lab values fell within the level of agreement.	28 children Compared hemograms, electrolytes, glucose, selected drug levels. Used stopcock to avoid break in line between discard syringe and reinfusion syringe.

Reinfusion of discard blood from venous access devices.

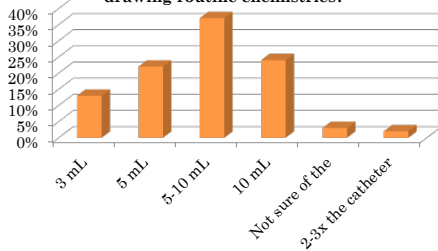
Cosca, PA, et al(1998) Oncology Nursing Forum To determine if clots are present in the initial 10 ml of blood routinely discarded from venous access devices (VADs) prior to blood sampling, and to determine if clots form in the discard blood specimen during the five minutes required to complete blood specimen sampling. Clots were found in both specimens.

A discard volume of twice the deadspace ensures clinically accurate arterial blood gases and electrolytes and prevents unnecessary blood loss. Rickard, CM et al (2003) Critical Care Medicine

Discarding the Initial Aliquot of Blood Does Not Reduce Contamination Rates in Intravenous-Catheter-Drawn Blood Cultures

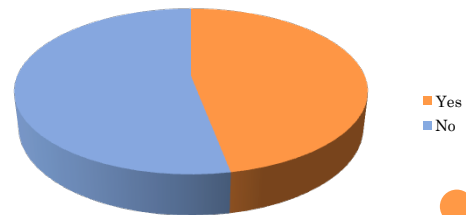
Dwivedi, S. et al (2009) Journal of Clinical Microbiology 653 intravenous catheters cultures. 30ml of blood was drawn. 10ml inoculated and second 20ml inoculated to determine contamination rates.

Q8. How much blood do you waste when drawing routine chemistries?



47% WASTE BEFORE BLOOD CULTURES
53% DO NOT WASTE BEFORE BLOOD CULTURES

Q11. When drawing blood cultures, do you waste?

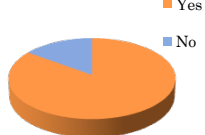


ORDER OF THE DRAW

When multiple samples are drawn, attention should be given to the order in which tubes are filled.

- Blood culture tube
- Coagulation tube (blue top)
- Serum tube with or without clot activator, with or without gel (red top)
- Heparin tube with or without gel plasma separator (green top)
- EDTA (lavender top)
- Glycolytic inhibitor (gray top)
- ACD (Light yellow)

Q10. Do you understand what order of the draw means?



85% answered Yes I understand what order of the draw means.

GUIDELINES FOR THE PREVENTION OF INTRAVASCULAR CATHETER-RELATED INFECTIONS (2011)

- Educate healthcare personnel regarding indications for intravascular catheter use, proper procedures for the insertion and maintenance of intravascular catheter related infections.
 - Category 1A
- Periodically assess knowledge of and adherence to guidelines for all personnel involved in the insertion and maintenance of intravascular catheters.
 - Category 1A
- Designate only trained personnel who demonstrate competence for the insertion and maintenance of peripheral and central intravascular catheters.
 - Category 1A

BEST PRACTICE: BLOOD SAMPLING VIA A VASCULAR ACCESS DEVICE (INS STANDARDS)

- Considered based on evaluation of benefits versus risk
- Knowledge regarding technical factors involved in blood specimen collection
 - changing the needleless connector
 - need for patient fasting prior to collection
 - use of appropriate blood collection tubes in the correct sequence
 - timeliness of dispatch to the laboratory
- Correct technique

INS STANDARD 57

Efforts to conserve blood should be considered:

- Low volume tubes
- Recording volume of blood obtained for laboratory testing
- Avoidance of routine testing
- Use of point of care testing
- Consolidation of all daily tests with 1 draw
- Consideration of the use of the mixing method for blood sampling from CVADs

JOINT COMMISSION NATIONAL PATIENT SAFETY GOAL 7-07.04.01

- **Central Line-associated bloodstream infections (CLABSI)**
- **NPSG.07.04.01:** Implement evidence-based practices to prevent central line-associated bloodstream infections.

CONCLUSION

- When obtaining blood samples from CVADs, care should be taken to ensure that blood loss is minimal, the potential for infection is minimized and an accurate sample is obtained.

FUTURE DIRECTIONS

- The next core measure, quality measure, or performance improvement project
 - Blood discard for BMT
 - Checklists for blood draw
- Disinfecting alcohol port protectors:
 - Joint Commission: EP 16 requires use of a "standardized protocol to disinfect catheter hubs and injection ports before accessing the ports".

REFERENCES

- Camps-Sorrell, D (2011). *Access device guidelines: Recommendations for nursing practice and education* (3rd ed) Pittsburgh: PA, Oncology Nursing Society
- Guidelines for the Prevention of Intravascular Catheter-Related Infections, (2011) Center for Disease Control
- Infusion Nursing Standards of Practice (2011). *Journal of Infusion Nursing* (34) 1S
- The Joint Commission. *Preventing Central Line-Associated Bloodstream Infections: A Global Challenge, a Global Perspective*. Oak Brook, IL: Joint Commission Resources, May 2012. <http://www.PreventingCLABSIs.pdf>.


REFERENCES

- Adlard, K. (2008). Examining the push-pull method of blood sampling from central venous access devices. *Journal of Pediatric Oncology Nursing*, 25(4), 200-207.
- Barton, S.J., Chase, T., Latham, B., & Rayens, M.K. (2004). Comparing two methods to obtain blood specimens from pediatric central venous catheters. *Journal of Pediatric Oncology Nursing*, 21(6), 320-326.
- Cicolini, G., Simonetti, V., Di Nicola, M., & Palma, E. (2011). Comparison of blood samples values by direct venipuncture and central venous catheters with 5 or 10 ml wasted blood. *Journal of Clinical Nursing*, 21, 281-284.
- Wyant, S. & Crickman, R. (2012). Determining the minimum discard volume for central venous catheter blood draws. *Clinical Journal of Oncology Nursing*, 16(5), 454-458.

BLOOD & MARROW TRANSPLANT (BMT) NURSING COMPETENCIES


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Overview of BMT Nursing Competencies

- Identify the complexities of BMT
- Identify the rationale for competencies and maintaining proficiency
- Provide examples of content that should be included in nursing orientation and training

 The James
The James Cancer Hospital and Saxton Cancer Center
Ohio State University

 NCC
National Cancer Center

ORIENTATION

- Process of educating newly hired staff in health care organizations to organization wide, departmental and job specific competencies before providing patient care, treatment, and services.
- Usually a one time process.

Joint Commission

TRAINING

- Development and implementation of programs that foster staff development and continued learning, address skill and deficiencies and thereby help ensure staff retention
- Allows opportunities for staff to develop job responsibilities
- Continuous process

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ONCOLOGY NURSING

- Multifaceted field
- Complex decisions
- Diverse situations
- Experience varies
- Professional plan for nurses

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NOVICE TO EXPERT: EXCELLENCE AND POWER IN CLINICAL NURSING PRACTICE

Benner, 1984
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COMPLEXITY OF CARE IN BMT

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Competency Assessment

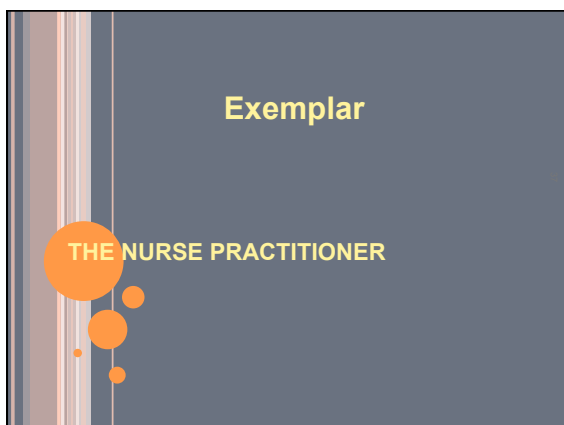
Learning Domain	Activities	Delivery Considerations	Assessment
Cognitive	Self-check quizzes Case studies Drill and practice Short answer essay Project or problem-based activities	Web-enhanced materials supplementing classroom lectures Hybrid course with cognitive content on the web Multimedia simulations of challenging and key concepts	Project based for higher cognitive skills Multiple choice or short essay questions Case Studies
Affective	Goal setting Self-reflective writing in a journal Practice tutorials designed for student success	Face-to-face meetings Motivational videos Streaming audio explanations and encouragement Interactive video, web casts, conference calls	Self-assessment using check-list Pre/post attitude survey related to course content Retention/success in course
Psycho-motor	Practice of desired skill with feedback Arranging sequences of an activity in correct order	Face-to-face demonstrations Demonstration videos Pictures with audio and text explanations Interactive video demonstrations	Performance of skill matches set standard as observed by an instructor or designee
Interpersonal	Structured team projects with debriefing Analyzing video models and identifying correct from incorrect performance	Face-to-face small group coaching and feedback sessions Check lists, examples, videos and other cognitive support material presented online	Team, instructor and self assessment measures Analysis of video taped student performance of desired interpersonal skill

http://www.fhda.edu/learning_domain.html

BMT ORIENTATION CONTENT FOR TRANSPLANT NURSES

- Overview of blood & marrow transplant
- History & development of transplantation
- Review of immunology
- Pathophysiology of diseases treated
- Common transplant complications
- Transplant terms and abbreviations
- Role of multidisciplinary team
- Hematology/oncology patient care
- Administration of blood products and transfusion therapy
- Central venous catheter care
- Blood product transfusion
- Stem cell mobilization and collection
- Mobilization regimens
- Common side effects of collection by apheresis
- Marrow Harvesting process
- Care needs and recovery following collection
- Transplant supportive care
- Administration of high dose chemo, growth factors, and immune suppressive medication
- Side effects of preparatory medications, including radiation
- Infection prevention & control in immunocompromised patients
- Reinfusion process
- Management of adverse reactions to cryopreserved stem cells
- Neutropenic diet
- Role of exercise
- EBP in common side effects: nausea, emesis, diarrhea, mucositis
- Ambulatory care
- Long-term side effects
- Psychosocial issues
- Caregiver needs and support
- Emotional impact of transplant
- Sexual changes
- Transplant competency evaluation process: annual review and skills update

Clifford, Acheson, Hall, 2013



DISCUSSION QUESTIONS

- Who charged with facilitating orientation and training?
- How long is this process?
 - Do budgets take this into account?
- What principles guide orientation & training?
- Who maintains the competencies?
- How does your center approach competencies?
- If a checklist approach is used, how are the learning domains accounted for?

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REFERENCES

Benner, P. (1984). From novice to expert: Excellence and power in clinical nursing practice. Menlo Park: Addison-Wesley, pp. 13-34.

Clifford, K.N, Acheson, J.B., Hall, J.J. (2013). Considerations in Hematopoietic Stem Cell Transplantation Development and Sites of Care. In Ezzone, S: (Ed), Hematopoietic Stem Cell Transplantation: A Manual for Nursing Practice (2nd ed). Oncology Nursing Society, pp. 67-102.

Knopf, K. E. (2011). Core Competencies for Bone Marrow Transplantation Nurse Practitioners. *Clinical Journal of Oncology Nursing*, 15(1), 102-105
http://pixel.fhda.edu/id/learning_domain.html

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**(UNSPEAKABLE) CONFLICTING TENSION IN
NURSES' WORK WITH CANCER
PATIENTS UNDERGOING BONE
MARROW TRANSPLANTATION**

Doris Leung, RN, PhD
ASBMT Conference: Feb. 15, 2013

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A DIAGNOSES OF CANCER

“In whatever kind of ‘race’ life might be, I have very abruptly become a finalist.” (when the New York Journalist, Christopher Hitchens discovers he has esophageal cancer, *Mortality*, 2012)

- ❖ The threat of mortality is pushed to the forefront of life

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THE THREAT OF MORTALITY

- Fear of death, (existential) isolation, freedom (perceived responsibility), and *meaninglessness* (*loss of purpose*)
 (Yalom, 1980)

Meaninglessness

- Risk factor for hopelessness (Rodin, et al., 2008)
 - Compared to depression has a greater relative influence on patients' wish to hasten their death
 (Jones, et al., 2003)

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SOURCES OF TENSION IN NURSES' WORK

- Given the unprecedented levels of care we can achieve with technology, patients "are exposed to a degree of suffering that previous generations might not have been able to afford," let alone experience
- May be left without a wish to die with dignity but a desire to *have died*:
 - Fearing complications of disease or treatment
 - Burden of suffering for family
 - Medical resources felt to be pointlessly expended

(Mortality, New York journalist, Christopher Hitchens, 2012)

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CONFLICTING TENSIONS

- Within the culture of cure, as on bone marrow transplant units, the stressful nature of cancer nurses' work is complicated by unspeakable conflicting concerns
 - Intents to fight cancer, while preparing patients for the possibility of letting go
 - Letting go the curative norms

[Leung, Esplen, Peter, Howell, Rodin, & Fitch. (2012). How hematological cancer nurses experience the threat of patients' mortality. *Journal of Advanced Nursing*, Oct;68(10):2175-84.]

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THE PATIENTS' BUBBLE OF HOPE

Nurses want patients to be fully informed, yet acknowledge that individuals need to regulate the flow of information as it relates to their awareness of the threat of mortality:

- Watched over patients' bubble of hope
- Recognized patterns of dying
- Reluctance to burst the bubble of hope

You want to be honest, but at the same time you don't want to burst their bubble because a lot of them have that much hope; they have that little ounce of hope.
(Carrie- auto unit)

[Leung, Esplen et al. 2012]

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MAINTAINING THE INTEGRITY OF THE "BUBBLE OF HOPE"

"Hope has a very special quality that is especially important in managing uncertainty over time: it allows us to hold conflicting expectations simultaneously." (Folkman, 2010; p. 905)

[Folkman, S. (2010). Stress, hoping, and coping. *Psycho-Oncology* 19: 901-908]

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THE BUBBLE OF HOPE: HOW FAMILIES MAY COPE

In two studies (Leung, Esplen et al. 2012 & Leung, et al, unpublished), the former in 2 bone marrow transplant units and the latter in a critical care unit*, nurses experience a responsibility to maintain the integrity of a bubble of hope for families

- Depends on nurses' emotional attunement to how families are coping

Things that I can remember is if the family is not coping. The family is...lots of times families become angry because they're not coping and that makes it difficult.
(Tess, allo unit)

*with patients maintained on mechanical ventilation for more than 2 weeks and have a 50% in-hospital mortality

COMMUNICATION AS A TOOL TO MITIGATE CONFLICTING TENSIONS

- ❖ While biomedical knowledge continually provides further technological tests and aggressive treatment, situated knowledge (including emotional attunement) of the patient's dying compels nurses to talk about alternatives to continuing treatment options

We have a pretty clear idea from the lab values and everything else and the way the disease is going in discussion with the doctors, where it's actually going, that we need to start preparing them [patients]. That we are no longer here in the continuum, but maybe here and we need to start doing the [end-of-life care] work.

(Kandy, auto and allo units)

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GOAL OF MITIGATING TENSIONS: TO REMAIN HOPEFUL

- ❖ Best evidence suggests clinicians engage in gradual disclosure with subtle calibration of information about alternative of continuing treatment:
 - ❖ Exploring meanings of ‘what is hoped for’ in some measure of “meaningful recovery” alongside clarifying information about treatment (Curtis, et al., 2008), I suggest, may be a compassionate way to maintain the integrity of a bubble of hope

“The person who holds conflicting expectations is not thought to be confused or delusional; the person is labeled hopeful.”

(Folkman, 2010, p. 905)

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FAMILY INVOLVEMENT IS KEY

- Most, but not all, identified substitute decision makers wish to share in decisions of care
- ❖ Clarifying preferences for family involvement
 - Ranges from passive to active involvement and is dependent on the type of decision
 - Important to ask family members:
 - What does the patient want?
 - What role they and other key family members want to play?
 - What role they desire the medical team to play?

[Lynn et al for SUPPORT Investigators *Annals of Internal Medicine*, 1997; 126(2): 97-106; Heyland, Tramer et al. *Journal of Critical Care*, 2003; 18(1 March): 3-10; Majesko et al. *Critical Care Medicine* 2012;40:2281-228]

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GUIDELINES FOR COMMUNICATION

Synthesis of best evidence suggest that clinicians look for opportunities (in “small doses”) to:

- Acknowledge emotions and support grief
 - Proactive structured family meetings
 - Introduce active options of alternative care while refraining from saying “there is nothing else we can do” (i.e., may trigger a sense of abandonment)
- Ask questions about patient preferences
 - Don’t wait for patient or family to bring it up
 - Lower anxiety = can tolerate more disclosure
- Coaching about expectations of surrogate decision-making
 - Do not want information so much to make decisions, but to increase confidence & feelings of control & mastery it provides
- Clarify information about treatment and its limits (e.g. do not resuscitate orders)

[Hack et al., 2005; Hagerly et al. 2005; Lautrete, et al. 2007]

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THE NURSE’S OWN INNER CONFLICT

- Confrontation with own mortality and finiteness of life
- Triggers moral tensions of loss and suffering that nurses share with patients

(Lavoie, Blondeau, & De Koninck, 2008)

“Knowing what I know, I’m not in the position where I’d have to make that decision, but I ask myself all the time, ‘What would I have decided if I had been this person and knew what I knew now, would I have gone through with this?’ ...A lot of times it’s no.”

(Zhanna, allo unit)

[Leung, Espien, et al., *Journal of Advanced Nursing*, 2012]

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THE NURSE’S SEARCH FOR MEANING

- ❖ Cancer nurses’ experiences on two bone marrow transplant units was constituted by a search for meaning of their involvement with patients’ loss and suffering (existential and physical) and sometimes dying

“So when either the family or the patient themselves have decided that they don’t want to suffer anymore, us or me being able to give them that hope that they will be as comfortable, and not suffer anymore gives great meaning to what I do, right?”

(Participant 4)

[Leung, D., Fillion, L., Duval, S., Brown, J., Rodin, G., & Howell, D. (2012). Meaning in Bone Marrow Transplant Nurses’ Work: Experiences Before and After a “Meaning-Centered” Intervention. *Cancer Nursing*, Sep-Oct;35(5):374-81]

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ENHANCING NURSES’ SELF-CARE

- ❖ Nurses struggle with whether and how to respond to distress and dying due to:
 - A. Lack of felt knowledge and skill
 - B. Fear of causing patients or families distress
 - C. Conflict between patient, family, and healthcare team
 - D. All of the above
- ❖ Nurses working in bone marrow transplant units can experience high personal growth and personal accomplishment in their work, yet also report moderate emotional exhaustion.

True or false?

1996]

[Molassiotis & Haberman,

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