Nurses are pivotal in the care of malnourished hospital patients
Bridget Davidson MHSc, RD
Executive Director
Canadian Malnutrition Task Force

CSGNA Conference
Niagara Falls, Ontario
October 2, 2014

DISCLOSURE

Speakers Bureau Abbott Nutrition

Learning Objectives

• To learn about the prevalence and causes of malnutrition in Canadian hospitals.
• To understand the difference between nutrition screening and nutrition assessment
• To learn how nurses, as an integral part of the inter-disciplinary team, can assist in preventing, detecting and treating malnutrition
Outline for Today’s Workshop

• What is malnutrition
• Who is the Canadian Malnutrition Task Force (CMTF)
• Overview of the Nutrition Care in Canadian Hospitals (NCCH) study design and results:
  – prevalence, burden of malnutrition, patient survey, nurses’ survey, dietitian workload
• Nurses’ role, as an integral member of the inter-disciplinary team, in nutrition care
  – nutrition screening
  – protected mealtimes

Human Costs of Malnutrition

Negative outcomes associated with malnutrition

✓ Delayed wound healing
✓ Impaired immunity
✓ Lower quality of life
✓ Impaired function
✓ Increased length of stay, readmission, mortality and/or morbidity rates

Health Costs of Malnutrition

Malnourished patients...

• Cost ~60% more than well nourished patients
  (Braunsweig et al., 2000; Comerota et al., 2003)
• Cost is independent of disease state
  (Lim et al., 2012)
• Length of stay (LOS) 2-6 days longer
  (Comerota et al., 2003; Kyle et al., 2004; Pinch et al., 2004)
• Developing malnutrition during hospitalization results in even longer LOS ~15 d
  (Álvarez-Hernández et al., 2012)
• 2 x increased risk of readmission in 2 weeks
  (Lim et al., 2012)
• Increased two-year mortality 7 fold
  (Lim et al., 2012)
Malnutrition is Treatable

✓ Generic oral nutrition supplementation (ONS) (Phillipson et al., 2013)
  - 1.6% of 44 million hospital episodes used ONS
  - decreased LOS by 21%, ~$4734 USD savings

✓ Scoping review - food first interventions (Cheung et al., 2013)
  - Individualized RD treatment → improved intake and health outcomes
  - protected mealtimes, eating assistance → improve food intake

✓ Implementation of guidelines in ICU - cluster RCT (Doig et al., 2008; Martin et al., 2004)
  - Early nutrition support improves outcomes

CMTF Vision

To advance nutrition care in adult and paediatric patients through research, education and interdisciplinary collaboration in Canada.

CMTF Four-Pronged Approach

1. Knowledge creation to influence best practice
2. Aggregate data on current rate and health impact of malnutrition
3. Develop best practices in nutrition care
4. Effect a culture change in nutrition care
CMTF Knowledge Translation Priorities

- Standardized screening is mandatory in acute care hospitals
- Administrators and health teams are educated on the need to integrate nutrition care into medical practice
- Mealtimes are patient focused; protected, care consistent with nutrition care plan
- Food and nutrition services are optimized to provide quality, appropriate (e.g. culturally, texture) food with adequate nutrients for recovery
- Interdisciplinary team is involved in nutrition care and roles are delineated; RD determines nutrition care plan, including route;
- Nutrition therapies, including oral nutrition supplementation, enteral and parenteral nutrition are used effectively

Principals of the CMTF

<table>
<thead>
<tr>
<th>Name</th>
<th>Province</th>
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<tbody>
<tr>
<td>Johane Allard, MD, FRCPC</td>
<td>Ontario</td>
</tr>
<tr>
<td>Paule Bernier, PDT, MSc</td>
<td>Quebec</td>
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<tr>
<td>Donald Duerksen, MD, FRCPC</td>
<td>Manitoba</td>
</tr>
<tr>
<td>Leah Gramlich, MD, FRCPC</td>
<td>Alberta</td>
</tr>
<tr>
<td>Khursheed Jeejeebhoy, MBBS, PhD, MRCP, FRCP</td>
<td>Ontario</td>
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<tr>
<td>Heather Keller, RD, PhD, FDC</td>
<td>Ontario</td>
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<tr>
<td>Manon Laporte, RD, MSc, CNISC</td>
<td>New Brunswick</td>
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<tr>
<td>Hélène Payette, PhD</td>
<td>Quebec</td>
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Support

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
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<tbody>
<tr>
<td>Bridget Davidson, MHSic, RD</td>
<td>National Study Coordinator</td>
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<tr>
<td>Elisabeth Vesnauer, PhD</td>
<td></td>
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<tr>
<td>Anastasia Teterina, PhD</td>
<td>Statistics</td>
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<tr>
<td>Wendy Lou, PhD</td>
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<tr>
<td>Lori Curtis, PhD</td>
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CMTF Sponsors

Through unrestricted educational grants, our sponsors help in the fight against malnutrition.
NCCH Study Objectives

1. To assess nutrition status and prevalence of malnutrition, including obesity, in hospital patients
2. To determine whether malnourished and obese patients have extended length of stay or increased 30-day re-admission and mortality
3. To demonstrate the change in nutritional status that occurs during hospitalization
4. To describe the practice of nutritional care
5. To determine if patients are satisfied with their nutrition care, including meals
6. To validate a feasible nutrition risk tool
7. To determine the cost of malnutrition

CMTF Adult Protocol

- Prospective cohort study
  - Patients followed during hospitalization
  - +30 days post-discharge
- Patient population: adults
  - Consecutive admissions
  - Hospital stay >2 days
  - Surgical and medical wards
- Exclusion: pediatric, obstetric, psychiatry, palliative, admitted directly to ICU
- 18 Academic/community/small and large centers, from 8 provinces
- Sample size: 1022 patients, 18 hospitals
  - 887 patient mealtime satisfaction surveys
  - 428 Physician surveys (18 sites)
  - 346 nurse surveys (11 sites - phases 2 & 3)

Measurements

ADMISSION:
- Subjective global assessment
- NRI, NRS-2002, CMTF screening tool
- Weight, height, BMI
- Mid-arm and calf circumference; hand grip strength
- C-reactive protein and plasma albumin
- 3-day 2-meal estimated record during first week of admission; nutritionDAY patient survey 1 meal per day
- Demography, CCI, diagnoses,...

HOSPITAL STAY:
- Nutrition care: visits from RD and DT
- Diet orders, ONS, EN/PN
- Weight q 2 days; repeat estimation of food intake, nutritionDAY patient survey 1 meal per day
- Antibiotic use, surgeries, other adverse events

NUTRITION CARE PROCESS:
- Physician/nurse survey
- Clinical nutrition & food services focus groups

DISCHARGE:
- Repeat nutrition measurements
- Patient satisfaction survey; length of stay; 30-day outcome
Patients’ Demography

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Median (range) or % of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>1022</td>
</tr>
<tr>
<td>Age (years)</td>
<td>66 (18-98)</td>
</tr>
<tr>
<td>Gender %</td>
<td>Male 51.91</td>
</tr>
<tr>
<td>Ethnicity%</td>
<td>Canadian 8.17, European 11.46, Asian^ 2.36, Aboriginal/Native 1.96</td>
</tr>
<tr>
<td>Education</td>
<td>High school 38.28, Post Secondary 40.45</td>
</tr>
</tbody>
</table>

^South Asian, West Asian, East/South East Asian.

Primary Admitting Diagnosis

Presence of Cancer on Admission 17.26%

Subjective Global Assessment (SGA)

<table>
<thead>
<tr>
<th>History</th>
<th>Physical Exam</th>
</tr>
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<tbody>
<tr>
<td>Weight change</td>
<td>Loss of subcutaneous fat</td>
</tr>
<tr>
<td>• Overall loss in past 6 months</td>
<td>Muscle wasting</td>
</tr>
<tr>
<td>• Change in the past 2 weeks</td>
<td>Ankle edema</td>
</tr>
<tr>
<td>Dietary intake change</td>
<td>Sacral edema</td>
</tr>
<tr>
<td>• Increase, decrease or no change</td>
<td>Ascites</td>
</tr>
<tr>
<td>Gastrointestinal symptoms for &gt;2 weeks</td>
<td>Clinical Judgment</td>
</tr>
<tr>
<td>• None, nausea, vomiting, diarrhea, anorexia</td>
<td>A = well nourished</td>
</tr>
<tr>
<td>Functional capacity</td>
<td>B = suspected or moderate malnutrition</td>
</tr>
<tr>
<td>• No dysfunction vs dysfunction</td>
<td>C = severely malnourished</td>
</tr>
<tr>
<td>Disease and its relation to nutrition status</td>
<td></td>
</tr>
</tbody>
</table>
Prevalence of Malnutrition at Admission Based on SGA

- Well Nourished (n=558): 54.98%
- Moderate Malnutrition (n=341): 33.60%
- Severe Malnutrition (n=116): 11.43%

Types of Malnutrition at Admission (n=369 SGA B/C with CRP)

<table>
<thead>
<tr>
<th>Type of Malnutrition</th>
<th>% (n) of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starvation-related malnutrition (SGA B or C, CRP &lt; 10mg/L)</td>
<td>23.58 (87/369)</td>
</tr>
<tr>
<td>Malnutrition + Inflammation (SGA B or C, CRP ≥10mg/L)</td>
<td>76.42 (282/369)</td>
</tr>
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</table>

Change in SGA

Admission vs. Discharge n=720

<table>
<thead>
<tr>
<th>frequency (row %)</th>
<th>Discharge</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well nourished</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admission</td>
<td>Well nourished</td>
<td>Moderate malnutrition</td>
</tr>
<tr>
<td>Well nourished</td>
<td>315</td>
<td>68</td>
</tr>
<tr>
<td>Moderate Mal'n</td>
<td>72</td>
<td>145</td>
</tr>
<tr>
<td>Severe Mal'n</td>
<td>9</td>
<td>25</td>
</tr>
<tr>
<td>Total Discharge</td>
<td>396</td>
<td>238</td>
</tr>
</tbody>
</table>

71% no change; 14.7% Improve; 14.3% worsen
n.s. difference Q= 1.55 p=0.67, McNemar-Bowker Test
Food Intake and Malnutrition

<table>
<thead>
<tr>
<th>Nutritional Status</th>
<th>&lt; 50% of food intake in week 1</th>
<th>&gt;= 50% of food intake in week 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well nourished</td>
<td>25.35%</td>
<td>74.65%</td>
</tr>
<tr>
<td>Starvation-related Malnutrition (SGA B or C and normal CRP)</td>
<td>22.08%</td>
<td>77.92%</td>
</tr>
<tr>
<td>Malnutrition + Inflammation (SGA B or C and elevated CRP)</td>
<td>43.28%</td>
<td>56.72%</td>
</tr>
</tbody>
</table>

31.36% of patients have a low intake in their first week of admission

NCCH Study Results

- SGA independently predicts
  - LOS
  - Mortality
  - As relevant as key predictors such as age, disease state
- Only food intake and handgrip add to the predictive ability of SGA
  - Other nutrition indicators are not needed to diagnose malnutrition
  - More comprehensive ax useful for treatment plan
  - Other indicators may be useful in monitoring

Patient Reported Difficulties with Eating

- Cutting food: 16.3%
- Self-feeding: 8.8%
- Poor position for eating: 27.6%
- Did not get help to eat meals: 7.8%
- Not enough time to eat meals: 7.4%
- Reaching meals: 19.9%
- Did not get food ordered (every meal): 3.1%
- Opening packages/unwrapping food: 30.2%
Nurse Survey Results

- N=346, 48% response rate (11 hospitals)
- 90% female, 80% ward nurses, 56% academic hospital

- While the prevalence of hospital malnutrition in the CMIF study was 45%, more than 20% of nurses stated that malnutrition was not a problem and 30% stated it was a problem in <25% of the patients.
- This is in contrast to the nurses’ self-reported knowledge of nutrition assessment, which scored a mean of 6.38 on a 10-point scale (1=low and 10=high). However, they considered the identification of malnourished patients very relevant to their practice with a mean of 8.4 on a 10-point scale.
- 91% of nurses reported that they would incorporate a 3-question nutrition screen as part of their admission process.

Which Patients Receive a Dietitian Consult (excluding TPN/EN)

- Type of hospital, diet technician, surgery do not influence if a dietitian visit occurs
- Only 1 of 18 hospitals had standardized screening program, and it was not fully linked to RD involvement
- RDs saw only 23% of patients
  - 45% of these patients were well nourished
  - 36% SGA B and 19% were SGA C

  - 75% of SGA B and 60% of SGA C were missed using a referral process

Systematic Process for Referral?

- Multivariate analyses Dietitian Consult < 3 and >=3 days
  - Less than 3 days
    - Younger patients
    - Metabolic diagnosis
    - Oral supplements pre-admission
    - Modified texture or renal diet on admission (OR > 5)
    - SGA C (OR 1.88)
  - 3+ days
    - SGA C (OR 2.17)
    - 2+ dx or a new dx
    - Dysphagia during hospitalization (OR 11.4)
    - Constipation
    - Antibiotic use
WE MUST DO BETTER THAN THIS…

Nutrition Risk

• A process towards the status of malnutrition, existence of antecedents to malnutrition (Chen et al., 2001)

Nutrition Screening

• process of identifying characteristics known to be associated with nutrition problems (American Dietetic Association (ADA), 1994)
• process of identifying those who have a nutrition diagnosis and benefit from further assessment and treatment by a dietitian (ADA, 2011)
Nutrition Screening

- It is a critical antecedent step in the Nutrition Care Process Model that is not typically completed by nutrition professionals. 
- It is a Rapid and Simple process conducted by admitting staff, busy nurses and other relevant professionals. 
- Nutrition Screening ≠ Nutrition Assessment

Efficacy & Effectiveness Framework

- Reliability
- Validity
  - Sensitive
  - Specific

Criteria of the Best Nutrition Screening Tool

- Tool must be:
  - Valid
  - Reliable
  - Feasible
### Criteria of the Best Nutrition Screening Tool

#### Valid
- **Sensitivity:** Ability of the screening tool to correctly identify patients at nutrition risk or malnourished.
- **Specificity:** Ability of the screening tool to correctly identify patients who are not at nutrition risk or malnourished.
- **Positive Predictive Value (PPV):** Probability that patients screened at nutrition risk or malnourished actually found to be so.
- **Negative Predictive Value (NPV):** Probability that patients screened as not at nutrition risk or not malnourished, truly are not.
  
  (Values ≥ 70% - adequate tool’s performance) Neelkum et al. 2011

#### Reliable
- Measures the agreement between the results of the tool when administered by different users (inter-rater).
  - Cohen’s kappa score:
    - 0.41-0.60 (moderate agreement);
    - 0.61-0.80 (substantial agreement);
    - 0.81-1.0 (almost perfect agreement)

#### Feasible
- Simple, quick and easy (taking < 5 minutes), data included in the EMR, no calculations, no laboratory data

### Canadian Nutrition Screening Tool (CNST)

<table>
<thead>
<tr>
<th>Ask the patient the following questions</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you lost weight in the past 6 months WITHOUT TRYING to lose this weight?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>If the patient reports a weight loss but gained it back, consider it as a net weight loss.</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have you been eating less than usual FOR MORE THAN A WEEK?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two &quot;YES&quot; answers indicate nutrition risk</td>
<td></td>
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</table>

The CNST is the first simple tool validated and reliability tested at admission to acute care hospital by a large number of untrained nursing personnel.
Canadian Nutrition Screening Tool

- The CNST identified 45% of the patients admitted to surgical and medical wards at nutrition risk.
- It is valid (sensitive and specific), reliable and feasible
  - It was tested for reliability with "untrained" nutrition professionals against the gold standard SGA

Inter-disciplinary Approach to Nutrition Care

- Good evidence to show that an inter-disciplinary team that is knowledgeable about the effect of malnutrition on patients’ health, and respects the difference adequate food intake has on patient outcomes can change the course of patient hospitalization. 1, 2
- Hospitals require inter-disciplinary nutrition protocols and guidelines that assist with the identification and nutrition management of acute care patients.

The Role of Nurses in Nutrition Care

- As members of the inter-disciplinary team, nurses play a vital role in the early identification of patients through screening.
- Nurses can make appropriate referrals to dietitians for nutrition assessment of patients at risk
- Consider initiation of ONS or other high protein, high calorie food items
- Nurses can assist with the protection of meal times
The Role of Nurses in Nutrition Care

- Imbed the CNST (two questions) in the nursing admission form, or use the hard copy form
- If the two questions answer yes – establish a system whereby the patient is referred to a dietitian or diet technician for an assessment
- Re-screen one week later if the patient was not at risk upon admission
- Capture inadequate food intake <50% of meals provided
- Weigh patients weekly
- Start small!!! Consider trialing this on one unit first

How the Team Becomes “Food Aware”

- What is a "protected meal time" program?
  - No interruptions during meal time – no blood work, no visits from health care professionals
  - Patients are positioned properly, dentures are in, trays are set up in front of the patient, packages are opened for the patients that need assistance, patients are fed if need be
  - Appropriate amount of time is given to the patient to eat the food

Draft Nutrition Care Algorithm – in the pipeline!

- Funded by Technology Evaluation for the Elderly Network (TVN)
- Feasible and practical algorithm for nutrition care of medical/surgical patients
- Developed and soon to be content validated in 5 Canadian hospitals
- Key steps include: screening, SGA, standardized treatment, comprehensive assessment, individualized treatment, monitoring, discharge planning
Knowledge Translation Plan

- Publish results
- Media campaign
- Conference presentations
- Briefing documents available on website
- Patient pamphlets
- Resources for health care professionals
- Work with Accreditation Canada to establish Malnutrition Risk Required Organizational Practice (ROP)
- Training on detection: screening, SGA
- Facilitated culture change

Facilitated Culture Change

- Working with Senior Management, Physicians, Nurses and Dietitians to improve nutrition practice
- If your hospital has the interest and wants to learn more about this opportunity please contact Bridget Davidson, Executive Director, at bdavidson@golden.net or (519) 741-0828.