Maximizing APN Access and Outcomes in Canadian Cancer Control:

Measuring Activity and Workload

Esther Green
Provincial Head of Nursing and Psychosocial Oncology, Cancer Care Ontario

Denise Bryant-Lukosius
Associate Professor, School of Nursing and Dept of Oncology, McMaster University
Director, Canadian Centre of Excellence in Oncology APN, Juravinski Cancer Centre
Presentation Objectives

• Define what is meant by nursing activity and workload

• Provide rationale for the need to measure APN workload and activity

• Summarize what is known about how APN workload and activity has been measured to date

• Discuss challenges, issues and strategies to measuring APN workload and activity
Nursing Activity and Workload

• Over the last 2 decades the focus in Canada and internationally has been on measuring staff nurse activity and workload for determining:
  – The overall number of RNs required for a unit, organization or health region
  – Day-to-day staffing needs

• There has been limited published data about measuring APN activity and workload

(CNA, 2003; Hadley, Graham & Flannery, 2004; McGillis Hall, 2006; RNAO, 2005; MoHLTC, 2006; Vincent & Beduz, 2010)
Nursing Activity

• Nursing activity = nursing work

• A definition of nursing is required to measure related activities

• Using the ICN definition of nursing, nursing work includes all nursing activities carried out by the nurse:
  – Direct and indirect care of patients, families, communities
  – Health promotion, illness prevention, illness management
  – Non-patient care activities such as advocacy, policy development, inpatient and outpatient health systems management, education

Nursing Workload

- No common definition
  - The amount of performance or effort required to carry out any job (Caplan & Jones, 1975)
  - The volume and level of nursing work (Arthur & James, 1994)
  - The totality of the need for nursing time from all the work that must be carried out over a defined period of time (Needham, 1997)
  - Nursing resource intensity (O’Brien-Pallas et al., 2007)

- Multiple factors influence nursing workload
  - Complexity of patient health needs and status, complexity and time required to deliver nursing interventions, nurse characteristics, skill level required, staff resources etc.

Model of Nursing Workload
Morris et al. (2007), Journal of Advanced Nursing 57(5), 463-471
Challenges of Measuring Nursing Workload

• Lack of a consistent framework and language

• Workload measurement systems (WMSs) are widely used but there are major issues related to their reliability, validity and utility
  – Time and accuracy of completion
  – Ability to reflect the scope and complexity of nursing work
  – How and if workload data is used in decision-making
  – Maybe useful for monitoring workload trends, but should not be used to make resource decisions in isolation of other data about the quality of care, patient health needs, nursing work life and staff resources

(CNA, 2003; McGillis Hall, 2006; RNAO, 2005)
Challenges of Using Nursing Workload Data

- To monitor gaps in meeting work demands and to make decisions about resource allocation, requires consensus on the appropriate level of effort or time required to complete common nursing activities (i.e. standardization of nursing time per activity).

- Workload data alone should not be used for making decisions about the allocation of nursing resources but be put into context and linked to other sources of data about patient demographics, diagnoses, outcomes and healthcare utilization and costs.

- Need for computer-based WMSs that are integrated with data from electronic patient health records, hospital data management and nursing documentation systems.

(CNA, 2003; Hossain & Alam, 2003; McGillis Hall, 2006; RNAO, 2005)
Needs for Measuring APN Activity and Workload

• Effective Health Human Resource Planning
  – Sufficient supply of APNs to meet demands for APN expertise and services
  – Within an interprofessional team and models of care delivery
Cancer Care Redesign

- Houston...we have a problem!
- Use evidence and best practice from other jurisdictions
- Planning...going beyond the supply and demand model
- Move away from historical practices for best quality
- Need to consider case mix and allocation of roles to meet the needs of patients
Incidence + Survival = Increasing Demand

Cancer Incidence

Trends in newly diagnosed cancers attributed to risk, population growth, and aging, Ontario, 2001-2018

Cancer Survival

Age-standardized5 6-year relative survival† for 14 common cancers‡, Ontario, 1992 to 1996 vs. 2002 to 2006

Data source: Ontario Cancer Registry, 2009
Prepared by: Cancer Care Ontario, Population Studies & Surveillance
Notes: 1. * See Technical Information for Method
2. † Using Brambilla’s period method, which estimates survival of all cases followed up during the specified periods
3. ‡ Cancers defined by SEER Site codes (see http://seer.cancer.gov/seerstatcodes/4652_d01_272008/)

Source: Ontario Cancer Registry, Cancer Care Ontario; Population Projections, Ontario Ministry of Finance; Postal Code to LHIN Conversion, Ontario Ministry of Health
Changing Patient Expectations in Health

THE TRADITIONAL HEALTH CARE MODEL

THE ZOOMER REVOLUTION

THE EMERGING HEALTH CARE MODEL

PATIENT

CONSUMER

- Passive or reactive
- Cedes authority to the doctor and the health system
- May complain but accepts treatments and outcomes
- Rarely looks for alternatives

- Proactive
- Respects doctor & health system but sees self as director of own health
- Unwilling to accept bad outcomes
- Actively looks for alternatives

From David Cravit, CARP
Recommendations: Need for Transformational Change

- Innovate our models of care and realign remuneration for the 21st century patient
- Reassess roles and responsibilities within care team
- Engage and empower patients and caregivers - increase self-management and care based on patient values and needs

What is it? What do we want to do?

• A project outlining a four-year plan of transformative change across the complete cancer care system

  • That will improve the patient experience and ensure the long-term sustainability of cancer care

• Through innovation and the development of a best-practice, patient-centred, multi-disciplinary model(s) of cancer care

Objectives:

1) Develop new model(s) of care delivery - evidence-informed, patient-centered and optimizing the use of health human resources

2) Implement the model(s), including addressing necessary remuneration, regulatory and other policy changes

3) Develop and implement a mechanism for continuous evaluation, modification and improvement, including the capacity for regular HHR modeling and planning
Figure 1: Health System and Health Human Resources Conceptual Model*

* O’Brien-Pallas, Tomblin Murphy, Birch, and Baumann (2001) adapted from O’Brien-Pallas and Baumann (1997)
Cancer Workforce Planning

• In Canada, there have been limited health human resource planning activities related to oncology APNs outside of Ontario

  – 2006 survey identified the activities, supply and distribution of oncology APNs and provided recommendations for future deployment in areas of high patient unmet need based on incidence/prevalence data and CCO policy priorities (Bryant-Lukosius, et al., 2007)

  – 2007 survey of healthcare administrators, estimated the need for 125 additional oncology APN positions over the next 5 years (Bryant-Lukosius et al., 2008)

  – Current deployment does not meet this expected demand
    • Lack of operational funding
    • Lack of objective data about current APN workload and gaps in meeting the demand for APN services and expertise
# Oncology Advanced Practice Nurses in Ontario in 2011

## Oncology APNs in Ontario, N=104

- **Clinical Nurse Specialist (CNS):** 52%
- **Nurse Practitioner (NP):** 48%

## Locations of Ontario Oncology APNs (N=104)

<table>
<thead>
<tr>
<th>Community</th>
<th>Partner Hospital</th>
<th>RCC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NP</strong></td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td><strong>CNS</strong></td>
<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>

## Ontario Oncology APNs areas of work (N=104)

- **Palliative/Pain & SM/ Supportive Care**: 19/12
- **Disease Site Group**: 14/10
- **Hematology**: 5/8
- **Unknown**: 6/6
- **Specialty Area**: 3/7
- **Program Area**: 5/3
- **Inpatient**: 2/4

---

<table>
<thead>
<tr>
<th>Program Area</th>
<th>CNS</th>
<th>NP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Program Area</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Unknown</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Hematology</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Disease Site Group</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>Palliative/Pain &amp; SM/ Supportive Care</td>
<td>19</td>
<td>12</td>
</tr>
</tbody>
</table>
# Ambulatory Oncology APN Workload

<table>
<thead>
<tr>
<th>Potential Metric</th>
<th>Elements</th>
<th>Location</th>
<th>Modality</th>
</tr>
</thead>
<tbody>
<tr>
<td># of referrals to APN service</td>
<td></td>
<td>From:</td>
<td>- Fax / Hard copy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Inpatient</td>
<td>- Email</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Ambulatory centre</td>
<td>- Phone</td>
</tr>
<tr>
<td># of daily clinic visits</td>
<td># of Scheduled</td>
<td>- Nurse-led clinic</td>
<td>- Phone</td>
</tr>
<tr>
<td></td>
<td># of Unscheduled</td>
<td>- Multidisciplinary clinic</td>
<td>- Email</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Treatment clinic</td>
<td>- OTN</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- In person</td>
</tr>
<tr>
<td></td>
<td># of New patient visits</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td># of Follow-up visits</td>
<td></td>
<td></td>
</tr>
<tr>
<td># of consultations</td>
<td># of Scheduled</td>
<td>- Inpatient</td>
<td>- Phone</td>
</tr>
<tr>
<td></td>
<td># of Unscheduled</td>
<td>- Ambulatory centre</td>
<td>- Email</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- ? Home visits?</td>
<td>- OTN</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- In person</td>
</tr>
<tr>
<td></td>
<td># of New patient visits</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td># of Follow-up visits</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Conceptualizing APN

Managing Environmental Factors

APN Environments (Input)

Advanced Nursing Practice Role Development & Implementation (Throughput)

APN Role Outcomes (Output)

Systems Model of APN, Bryant-Lukosius, 2003
Needs for Measuring APN Activity and Workload

• Excessive nursing/APN workload is associated with:
  – Poor oncology APN job satisfaction (Bryant-Lukosius et al., 2007)
  – Increased patient mortality (Aiken et al. 2002)
  – Increased complication rates and poor quality of care (Rodgers et al., 2004)

• Need to link APN activities with outcomes (Bryant-Lukosius, 2010)
  – Recognize the unique contribution of APN expertise and efforts in the delivery of cancer services
  – Determine the level of APN dose or amount of APN work or dose intensity required to meet the health needs of patient populations with different types, severity and complexity of needs
  – Accountability for performance
  – Resource allocation decisions are increasingly made based on information about output and outcomes
Literature Review on Measuring APN Activity and Workload

- **Key search terms:**

<table>
<thead>
<tr>
<th>APN Related Terms</th>
<th>Workload Related Terms</th>
<th>Measurement Related Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Practice Nurse(s)</td>
<td>Workload/work</td>
<td>Measuring/Measure/Measurement</td>
</tr>
<tr>
<td>Advanced Nursing Practice</td>
<td>Activities/activity</td>
<td>Evaluation/evaluate/evaluating</td>
</tr>
<tr>
<td>Clinical Nurse Specialist(s)</td>
<td>Task(s)</td>
<td>Impact</td>
</tr>
<tr>
<td>Nurse Practitioner(s)</td>
<td>Performance</td>
<td>Dimension(s)</td>
</tr>
<tr>
<td>Nurse Consultant(s)</td>
<td></td>
<td>Capacity</td>
</tr>
<tr>
<td>Nurse Specialist(s)</td>
<td></td>
<td>Quantification/quantify</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scaling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Survey</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comparing/comparative/Comparison</td>
</tr>
</tbody>
</table>
Literature Review on Measuring APN Activity and Workload

• Databases: MEDLINE*, CINAHL*, EMBASE*, HealthSTAR, Web of Science
• Limits: Articles published in English or French, and between 1980 or 2005* to present
• Results
  – Total number of articles: 1211
  – Total number of primary studies that examined activities or workload: 38
  – Descriptive or scholarly essay papers: 2
### Primary Studies (n=38)

<table>
<thead>
<tr>
<th>Practice Patterns (Activity)</th>
<th>Canadian</th>
<th>International</th>
<th>Oncology</th>
<th>CNS</th>
<th>NP</th>
<th>APN or Nurse Consultant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice Patterns (Activity)</td>
<td>4</td>
<td>32</td>
<td>6</td>
<td>9</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>Workload</td>
<td>2</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>
APN Activities

• Clinical practice or direct patient care
  – Specific to type of APN role and role focus

• Teaching, mentoring and/or coaching

• Research and evidence-based practice
  – Developing and implementing practice guidelines

• Administration or leadership

• Consultation

• Systems support, program planning & development

• Publication and scholarly work
**APN Activities**

- **Majority of studies used self-report activity surveys**
  - provide estimates of how much time is spent on patient care and non-patient care activities based on *APN perceptions*

- **Time studies provide more accurate measure of the *actual vs perceived time spent on activities*** (Robichaud & Hamric, 1986; Ridley et al, 2000)
  - Helpful for refining the role and prioritizing activities to address changing clinical practice needs and organizational priorities
  - Aid in establishing realistic role expectations among APN stakeholders
  - Provide justification for additional resources with consistent trends for overuse of APN in one area of activity and/or overtime hours
  - Strengthened by collection of data about factors that influenced work time (i.e. APN, patient, organizational, team)


**APN Workload**

- **US Veteran’s Affairs Task Force** (Robinson et al., 2000)
  - APN workload measurement limited by taxonomy of activity tools
    - International Classification of Diseases – ICD-9 and Current Procedural Terminology – CPT coding system that was medically focused
  
  - CPT did not capture nursing activities as well as the Nursing Interventions Classification (NIC) system

  - The few APNs who were measuring workload were using inconsistent standards, language and practices
APN Workload

• **US Veteran’s Affairs Task Force Recommendations** (Robinson et al., 2000)
  - Electronic patient record that captures inpatient and outpatient APN workload
  
  - Establish productivity standards for APNs (amount of input required to achieve a specific output or outcome)
  
  - APN education about workload measurement methods and related risk management in the reporting of activities
  
  - Implement a standardized nursing language system (i.e. NIC, NANDA)
APN Productivity

- **Workload as a measure of NP productivity** (Rhoads et al., 2006)
  - A measure of output per unit of input or a measure of work produced during a time frame
  - Often expressed as:
    - Number of patients seen per day
    - Amount of revenue generated
  - Becomes a measure of efficiency when other factors such as time and complexity are considered
  - Productivity also needs to consider quality or how well the NP meets the needs of the community being served
  - Influenced by APN availability, affability and ability
  - NP competencies provide the basis for determining standardized activities that are the focus of productivity measurement
**APN Productivity**

- **Workload as a measure of NP productivity**  
  (Rhoads et al., 2006)
  - Medically driven based on physician re-imbursement codes and productivity payment
    - Total costs, growth rate of referrals, consults, visits, admissions
    - Relative value codes are assigned to activities to measure differences in physician effort, efficiency and compensation for different tasks

  - Need to consider other NP specific elements:
    - procedures per encounter
    - appropriateness of procedures
    - time devoted to productive activities
    - efficiency of time use for specific activities
Conclusions

• Meaningful measurement of APN workload is complex

• Much still needs to be learned about the feasibility of measuring and ensuring the validity and reliability of APN workload data

• Important for APN workload initiatives to build on the lessons learned about measuring nursing workload

• Investment in data management support and in electronic health records and data collection systems will be required to provide high quality data that can be used effectively for HHR planning decisions in cancer control
Implications

• Measurement of APN activity and workload must:
  – Be guided by clear goals and objectives for data use
  – Include opportunity for ongoing evaluation, refinement and accountability for the resources required to collect high quality and credible data
  – Employ standardized terms to describe the multi-dimensions of APN work beyond direct/indirect patient care
    • Explore the applicability of the CANO (2001) competencies and existing nursing documentation systems (i.e. NIC or NANDA)
  – Use time efficient and user-friendly electronic data collection systems that are standardized across cancer centres in Ontario/Canada to reduce the time burden on APN documentation and provide ability to compare standardized data across organizations and healthcare systems
Implications

• APN workload data must be integrated with data from patient electronic health records and organization information systems
  – To link patient and system factors that influence the type, frequency, intensity and complexity of APN activities and therefore time required to complete activities
  – To link APN activities and workload with patient health outcomes and health system outcomes (wait times, quality of care, costs)
    • For example C-HOBIC – Canadian Health Outcomes for Better Information about Patient Care
    • Collection of standardized patient outcome data related to nursing care in electronic health records
Implications

• Given the not-for profit nature of the Canadian health system, a focus on cost savings and cost avoidance rather than revenue generation (like the US) may be more appropriate as a system’s outcome
  – i.e. cost savings/avoidance through improved RN staff retention and/or reduced LOS, admission rates, complication rates, resource use, liability costs etc.
Implications

• The validity, reliability and utility of oncology APN workload data will be dependent on:
  – Degree of APN buy-in and commitment
  – APN education, training and support to ensure consistency of and compliance with data collection

• If resource decisions are based on standardization of time required for APN activities....
  – What activities should be standardized or/are amenable to standardization?
  – How will consensus on standardization be achieved?
  – What variables or factors need to be considered in the weighting of time to complete specific APN activities?
Discussion

• Should we measure APN workload and activity?
  – If so why? If not, why?
  – What are the advantages/disadvantages of measuring APN workload and activity and for whom?

• Who should decide what information will be collected and for what purpose?
Discussion

• How is APN workload and activity being measured in your institution?

• How is collected APN workload and activity data being used in your organization?

• What are enablers and barriers to the effective measurement of APN workload and activity?
Discussion

• What next steps should be taken to improve our ability to collect high quality and useful APN workload and activity data?
  – Provincially
  – Nationally
  – Internationally