Establishing the Value of Occupational Health Nurses’ Contributions to Worker Health and Safety
A Pilot Test of a User-Friendly Estimation Tool

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ABSTRACT
Occupational health nurses use their knowledge and skills to improve the health and safety of the working population; however, companies increasingly face budget constraints and may eliminate health and safety programs. Occupational health nurses must be prepared to document their services and outcomes, and use quantitative tools to demonstrate their value to employers. The aim of this project was to create and pilot test a quantitative tool for occupational health nurses to track their activities and potential cost savings for on-site occupational health nursing services. Tool development included a pilot test in which semi-structured interviews with occupational health and safety leaders were conducted to identify current issues and products used for estimating the value of occupational health nursing services. The outcome was the creation of a tool that estimates the economic value of occupational health nursing services. The feasibility and potential value of this tool is described. [Workplace Health Saf 2014;62(1):36-41.]
billion, according to the Bureau of Labor Statistics (Denniston & Whelan, 2005).

One option for employers to control costs and increase employees’ productivity is a worksite program that provides both health protection and health promotion services to improve workers’ quality of life and the company’s profitability (Goetzel et al., 2002; Henke et al., 2010; Kelly et al., 2010; Rosen & Spaulding, 2009). Identifying employees’ health risks and implementing strategies to eliminate or mitigate these risks can reduce costs associated with both occupational and nonoccupational injuries and illnesses (Redmond & Kalina, 2009). Direct costs represent the value of goods and services used in the treatment, care, and rehabilitation of a given illness or injury (Leigh, Waehre, Miller, & Keenan, 2004). Indirect costs are the value of lost economic output, including lost wages and administrative costs because of illness or injury-related work disability or premature death (Leigh et al., 2004).

An integrated approach to managing health risks is one model supported by the literature. It has been suggested that occupational health nurses will assume organizational leadership roles by coordinating programs and services across departments that offer health, wellness, and safety benefits (Blizzard, 2006; Marinescu, 2007; Wallace, 2009). These integrated models use health promotion initiatives, insurance benefits (e.g., general health care, short- and long-term disability, and workers’ compensation), paid sick leave, and employee assistance and occupational health and safety programs as strategies to improve workers’ well-being, morale, and productivity.

Additionally, company executives can maximize employee productivity and reduce health care costs by reducing the number and severity of disability claims and on-the-job injuries, as well as lowering rates of absenteeism by engaging occupational health nurses in designing, managing, and evaluating health promotion and protection programs. One strategy for measuring the impact of occupational health nurses’ work is benchmarking, which provides the diagnostic tools to measure and manage productivity, demonstrate results, and justify the resources used to reach desired outcomes (Denniston & Whelan, 2005). Benchmarking assists occupational health nurses to secure the resources they need to accomplish programmatic goals and improve the health and safety of workers (Denniston & Whelan, 2005). Although an intuitive link may exist between employee health and productivity, it is difficult to crystallize this into financial investment strategies or to link the potential work loss to the company’s bottom line” (Berger & Nicholson, 2003).

Although financial impact is usually of utmost concern to health and wellness program sponsors, organizations are also interested in establishing the effect of these programs on the health and well-being of participants (Goetzel et al., 2002). Programs such as the provision of on-site nursing services for health consultation and teaching may have hidden value because these services also benefit workers and their families who may have limited access to primary health care providers. Although the Patient Protection and Affordable Care Act is likely to improve health insurance coverage for families, how health care reform will affect access to care, time with providers, and overall health status is unknown (The Henry L. Kaiser Family Foundation, 2012). Workers have benefited from on-site nurses regarding workplace health and safety and workers’ ability to use the health system cost-effectively (Bodenheimer & Grumbach, 2005). On-site occupational health nurses decrease health-related costs to employers and the organization’s health care spending (Berger & Nicholson, 2003).

This article describes the development and initial pilot test of an Excel-based (Microsoft Corporation, Redmond, WA) tool to measure the economic value of occupational health nursing services. This easy-to-use tool can be adapted to different companies in different settings to estimate occupational health nurses’ monetary contributions to the company. Such financial estimations can be used to keep occupational health workers employed and workers safe and healthy.

METHODS

One strategy to quantify the value of occupational health nurses’ work in monetary terms is to identify or create a tool that will “prove their worth” to company leadership. A review of the literature and semi-structured interviews with occupational health leaders from a major Midwestern city were conducted to identify tools that estimate the economic value of occupational health nursing services. The best known and most frequently used method for quantifying return-on-investment in the occupational health literature is cost–benefit analyses (Lim, 2005). This project did not involve the creation of a formal return-on-investment tool; instead, a user-friendly, Excel-based tool was developed to estimate occupational health nurses’ economic impact. The estimates of cost-saving associated with occupational health nursing services could be used to trend outcome variables and costs associated with employing an occupational health nurse, (e.g., salary and benefits, space, equipment, and supplies) for a comprehensive assessment tailored to each setting.

Sample Selection

A purposive sample of five occupational health and safety professionals with nursing backgrounds employed in leadership roles in their organizations were selected and invited to participate in an interview with one of the authors. All participants were employed by mid- to large-sized organizations and the interviewees had combined occupational health experience of more than 60 years. Additionally, two Human Resources professionals from organizations under contract with the consulting firm were interviewed as part of a needs assessment.
Participants’ titles and roles varied. One worked as a Senior Safety Specialist, two as Occupational Health Nurse Managers, one as the Director of Safety and Environmental Management, and one as an Occupational Health Nurse. Although they had different titles and practiced in different organizational structures, they all focused their efforts on the health and safety of workers.

Data Collection

The purpose of the leader interviews was to identify if and how these leaders estimated the economic value of nursing services to their executive leadership. Semi-structured interviews were conducted about the structure of each respondent’s occupational health program, the personnel involved, the effect of the program on workers, and the type of data collected to demonstrate the economic value of occupational health services. The Human Resources professionals were interviewed about the role of occupational health professionals in ensuring the success of health and safety programs. Similar questions were asked of leaders, but interviews were tailored to the role of the interviewee and the organizational structure of the health and safety team at their workplaces.

Handwritten notes were taken by the interviewer and subsequently typed and analyzed for common themes. The data from the interviews and the literature review were used to develop an Excel-based cost estimation tool for the consulting company occupational health nurses to estimate and track the economic value of their daily health promotion services and case management for workers.

The tool was pilot tested by an occupational health nurse for the consulting company. It was also evaluated by other occupational health nurses currently working in the field for its potential efficacy and suggested revisions were incorporated. The final product was presented at a state American Association of Occupational Health Nurses (AAOHN) meeting where the tool received positive feedback by practicing occupational health nurses. Data were gathered anecdotally, based on requests from multiple occupational health professionals for the tool so that it could be adapted to their employers. A poster presentation describing the tool won second place in the poster practice category at the 2012 AAOHN National Conference.

Findings From the Interviews

The findings from the interviews revealed key themes about the potential value of health promotion and prevention programs and the importance of documenting occupational health nurses’ worth:

- A need always exists to justify to management that occupational health services positively affect workers and also improve profitability for the company.
- The field of occupational health is always changing and requires occupational health and safety professionals to be flexible and open to change.
- When developed and monitored, a worksite occupational health program has the potential to increase safety for workers while decreasing costs for employers.
- Companies realize that wellness programs and health risk assessments are beneficial to their workers and their profitability.

Description of the Excel Tool

Based on the themes identified in the surveys, six worksheets were developed within an Excel spreadsheet that identified specific responsibilities of occupational health nurses to estimate the potential value these nurses bring to a company. The worksheets were developed based on key assumptions described for each worksheet.

Worksheets 1 and 2 estimate the cost savings when a worker visits an occupational health nurse on-site rather than seeking care from a community provider. This approach assumes workers either voluntarily seek healthcare services due to a health-related concern, or lacking access to the occupational health nurse would have paid a primary care provider to render services. In this case, the occupational health nurse’s efforts are valued using Current Procedural Terminology (CPT) codes and the dollars associated with those coded services.

Worksheet 3 measures the savings realized when occupational health nurses coordinate short-term disability and uses Disability Duration Guidelines to determine cost savings (American Medical Association, 2011). Although guidelines are inherently subjective given the many factors that influence recovery from illness and injury and return to work, they are a resource for practitioners predicting disability duration for many illnesses and injuries.

Worksheet 4 estimates savings from the management of employee illnesses and injuries in the workers’ compensation system. These estimates assume that the occupational health nurse works in a state where the workers’ compensation system allows case managers to consult with employers about the amount of money set aside by the insurer based on claims experience (reserve funds), one approach for determining the amount of reserves for claims rather than using evidence-based estimates established by rigorous research.

Worksheet 5 estimates the savings from occupational health nurses providing training such as cardiopulmonary resuscitation and first aid to staff instead of the company hiring an outside educator for this purpose. This worksheet assumes the training would still be provided in the absence of the occupational health nurse. An employer’s willingness to pay for training may vary according to whether the training is required for regulatory compliance or voluntary. The last worksheet is simply a total of all cost savings. This total can be presented to management and might be used for expanding the occupational health program and services staff. Details on each worksheet are described below. Sample worksheets are provided in the Appendix (available in the online version of this article).

Worksheet 1: Estimate of Reimbursable Costs for Occupational Health Nurse Visits

The first worksheet documents employees’ visits to the occupational health nurse and the estimated savings...
related to avoidance of a worker’s visit to an external community clinic. These visits are organized by primary reason for the visit based on CPT codes for billing and insurance and matched to the Medicare physician payment schedule and reimbursement dollars available on the American Medical Association website (American Medical Association, 2011). Level 1 office visits were used most frequently by occupational health nurses for coding their visits because these codes are related to the evaluation and management of established clients without a physician’s on-site input. The presenting client problem at these visits may be minimal. The next type of visit was for immunization administration, such as influenza and hepatitis B, commonly given on-site. The last type of visit was used when occupational health nurses eliminated the need for a physician visit by providing education and symptom management consistent with the nurses’ professional license and role. The codes for this visit differed based on whether the employee would be considered a new client or a repeat or existing client. The nurse could document the number of each type of visit provided on a daily basis, and the estimated amount of the Medicare reimbursement automatically summed for all columns.

Within Worksheet 1, a table documents the specific reason for the nursing visit (Figure 1). This tally can also be displayed as a graph of visit trends, but the trends are not added to the monetary cost savings.

Worksheet 2: Estimate of Work Hours Saved by On-site Nursing Care

This worksheet estimates the time saved by workers who use on-site care rather than a community provider. Two hours were estimated for a community clinic appointment (Chenoweth & Garrett, 2006). Employees’ wages per hour are multiplied by 2, the estimated number of hours away from work, and then added to the final estimate of cost savings.

Worksheet 3: Estimate of Savings From Short-Term Disability Case Management

This worksheet is only for reporting of short-term disability. When illnesses and injuries resulting in short-term disability are not managed directly by an internal occupational health nurse but rather an external company, these employees are typically awarded the maximum daily guideline for their condition regardless of whether this value fits their particular cases. This sheet maps the MD Guidelines maximum disability duration by specific worker conditions. MD Guidelines is Reed Group’s evidence-based resource for returning employees to work and maintaining a healthy workforce. Its core product is the MDA (The Medical Disability Advisor) disability duration guidelines, developed by Presley Reed, MD, and colleagues. The nurse can subtract the actual days a worker was absent from the maximum allowed by the MDA, taking into account individual differences in employees’ conditions and time absent. These saved days are multiplied by workers’ hourly wage to calculate cost savings.

Worksheet 4: Estimate of Cost Savings From Worker’s Compensation Cases

This worksheet estimates the savings from managing workers’ compensation cases by monitoring open cases and “closing” cases when appropriate. Early closing can save companies money because the workers’ compensation adjuster establishes reserves, the number of dollars needed to cover the legal and financial obligations of the insurer arising from the workers’ compensation claim, for each claim. Reserves are generally established for indemnity, health care, and other claims. Based on the nature of the injury and the initial medical report, the adjuster anticipates employees’ expected duration of leave from work and any light duty and health care needs, disability ratings, and anticipated expenses. The claims administrator sets aside employer funds to cover those expenses, which could alternatively be used by the employer to generate corporate revenue. One of the occupational health nurses interviewed for this project reported that if the nurse has evidence that would suggest a given employee will have a shorter duration of leave or light duty work or less health care or other expenditures, then the company can negotiate with the insurance adjuster to reduce reserves or close the claim depending on the circumstances.

Worksheet 5: Estimate of Cost Savings From On-site Health and Safety Training

On-site occupational health nurses can offer employee health and safety training such as bloodborne pathogens or musculoskeletal stretching as part of their work expectations. This savings estimate assumes the training provided by the occupational health nurse would otherwise be contracted to an external provider. This sheet compares the cost of training provided by on-site nurses to an estimate of the cost of those services if externally purchased.

Worksheet 6: Estimate of Total Cost Savings

This worksheet totals the direct cost savings from Worksheets 1 to 5. This total is consistently updated as the other pages are revised, and can be viewed at any point.

DISCUSSION

The Excel-based tool described in this article is based on themes identified by five occupational health

![Figure 1. Reasons for visit to the occupational health nurse.](image)
and human resource professionals who assisted in creating a user-friendly tool for occupational health nurses to quantitatively document the value of their programs and services. Because the concepts included here are broad, and not specific to a single organization, this tool is useful for any on-site occupational health nurse. To use the tool, each occupational health nurse must identify reasons for worker visits to the nurse and may need to adapt or expand the tool depending on specific health services provided by the organization. Companies must also determine how frequently occupational health nurses will report to management and create a system of review. These decisions will affect the length of time the tool is in use before reports are submitted and the tool is reset for comparison across time.

Well-developed tools, such as this one, have been used to hire safety personnel and demonstrated cost savings to a company as a result of employing occupational health and safety professionals. It is imperative that occupational health professionals be flexible and open in regard to the changing needs of workers and management, develop programs that improve the health and safety of workers, and document their actions in a quantifiable way. Occupational health nurses should meet with company financial and accounting staff to review the tool and the metrics most meaningful to employers.

LIMITATIONS

This tool was created using a small sample of individuals from one urban, Midwestern location and may not be generalizable to all companies. However, the individuals interviewed included representatives of employers’ global corporate headquarters for Fortune 100 firms and small, local businesses. The tool provides an estimate of the economic value of occupational health nursing services, but is based on several assumptions described in the Methods section of the article. These assumptions may or may not hold true for a given employer and employee. For example, the tool estimates the cost of an external provider visit, but an employee might not actually seek health care in the absence of an on-site occupational health nurse, and thus that cost would not have been incurred. To know whether an employee would visit an external health care provider in this scenario would require a prospective cohort study for which the researcher would observe the actions of employees when they have health concerns with and without access to an occupational health nurse. Knowing whether the assumptions hold true for various types of employers would require rigorous and comprehensive research beyond the scope of this project. Although assumptions were made related to potential costs avoided or saved, extensive feedback was sought from occupational health and human resource professionals with years of experience. This tool can be tailored to each company’s needs and is useful for documenting the value of occupational health nursing services.

CONCLUSION

The tool described in this article is one example of estimating potential cost savings through the activities of an on-site occupational health nurse. Moreover, the only cost associated with this method is a computer with Excel software and the time to document nursing services. Further research could broaden this estimation by incorporating the cost of occupational health nursing services such as salaries and benefits of the occupational health staff, equipment and supplies, and any other associated costs. Additional research regarding the ability of occupational health nurses to affect employees’ risk profiles and how this affects health insurance and health care costs is crucial. Future research could also explore how occupational health professionals might affect the health of employees with limited access to primary care providers. The potential for improved health and cost savings to society by the health education provided by an on-site occupational health nurse is significant.

REFERENCES

gog.ama-assn.org


### Worksheet 1: Estimating Reimbursable Costs for OHN Visits and Frequency of Reasons for Visits

<table>
<thead>
<tr>
<th>Type of Visit</th>
<th>Number of Visits</th>
<th>CPT Code</th>
<th>Reimbursable Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level-One Office Visit</td>
<td>10</td>
<td>99211</td>
<td>193.8</td>
</tr>
<tr>
<td>Vaccination</td>
<td></td>
<td>900471</td>
<td>22.75</td>
</tr>
<tr>
<td>Prevention of a new patient MD Visit</td>
<td></td>
<td>99203</td>
<td>99.14</td>
</tr>
<tr>
<td>Prevention of an established (revisit) MD Visit</td>
<td></td>
<td>99213</td>
<td>67.02</td>
</tr>
</tbody>
</table>

**Reason for Visit (Tally):**
- Anxiety: 3
- Back Pain: 2
- Blood Pressure Check (Nurse Visit): 6
- Burns: 2
- Carpal Tunnel: 3
- Case Management-Workers’ Compensation: 6
- Caught in, on, or between: 4
- Chemical Exposure: 2
- Contusions: 3
- Crush Injury: 3
- Depression: 3
- Dermatitis: 3
- Early Symptom Management: 2
- Epicondyritis: 1
- Ergonomic Evaluation: 2
- Eye Care after Sialodochic Injury: 1

**Next**

### Worksheet 2: Work Hours Saved by Onsite Nursing Care

<table>
<thead>
<tr>
<th>Date</th>
<th>Hourly Wage</th>
<th>Estimate of Work Hours Saved</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>3/26/2012</td>
<td>10.5</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>3/26/2012</td>
<td>22</td>
<td>2</td>
<td>44</td>
</tr>
<tr>
<td>3/27/2012</td>
<td>8.5</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>3/27/2012</td>
<td>9</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>3/28/2012</td>
<td>22</td>
<td>2</td>
<td>44</td>
</tr>
<tr>
<td>3/29/2012</td>
<td>10.5</td>
<td>2</td>
<td>21</td>
</tr>
</tbody>
</table>

**Next**
Worksheet 3: Estimate of Savings From Short-term Disability Case Management

<table>
<thead>
<tr>
<th>Date</th>
<th>Condition</th>
<th>MD Guidelines Max (medium duty)</th>
<th>Actual Days Off</th>
<th>Days Saved</th>
<th>Hours per Day</th>
<th>Hourly Wage</th>
<th>Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/26/2012</td>
<td>Back Pain</td>
<td></td>
<td>56</td>
<td>37</td>
<td>19</td>
<td>8</td>
<td>105</td>
</tr>
<tr>
<td>3/26/2012</td>
<td>Carpal Tunnel Syndrome</td>
<td></td>
<td>28</td>
<td>14</td>
<td>14</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>3/27/2012</td>
<td>Shoulder, Sprain and Strain</td>
<td></td>
<td>21</td>
<td>19</td>
<td>2</td>
<td>12</td>
<td>105</td>
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<tr>
<td>3/28/2012</td>
<td>Chemical Fear</td>
<td></td>
<td>7</td>
<td>0</td>
<td>1</td>
<td>8</td>
<td>105</td>
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<tr>
<td>3/30/2012</td>
<td>Epicondylitis (Medial and Lateral)</td>
<td></td>
<td>58</td>
<td>50</td>
<td>6</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>4/2/2012</td>
<td>Heat Exhaustion</td>
<td></td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>12</td>
<td>105</td>
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Worksheet 4: Estimate of Cost Savings From Worker’s Compensation Cases

<table>
<thead>
<tr>
<th>Workers’ Compensation Loss-Run Savings</th>
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<tbody>
<tr>
<td>Claim Condition</td>
<td>Savings from early closing</td>
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<tr>
<td>Carpal Tunnel Syndrome</td>
<td>1200</td>
</tr>
<tr>
<td>Caught in, on, or between</td>
<td>500</td>
</tr>
<tr>
<td>Crush Injury</td>
<td>325</td>
</tr>
<tr>
<td>Fracture</td>
<td>575</td>
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Next
Worksheet 5: Estimate of Savings From Onsite OHN Health and Safety Trainings

<table>
<thead>
<tr>
<th>Program</th>
<th>Number of Trainings (Same Day)</th>
<th>Cost for Trainings</th>
<th>Travel Time (Use Decimals)</th>
<th>Travel Cost per Hour</th>
<th>Total Travel Cost</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Borne Pathogens</td>
<td>2</td>
<td>$45</td>
<td>0.75</td>
<td>90</td>
<td>67.5</td>
<td>612.5</td>
</tr>
<tr>
<td>First Aid</td>
<td>1</td>
<td>350</td>
<td>0.5</td>
<td>90</td>
<td>45</td>
<td>395</td>
</tr>
<tr>
<td>CPR</td>
<td>1</td>
<td>350</td>
<td>0.5</td>
<td>90</td>
<td>45</td>
<td>390</td>
</tr>
<tr>
<td>Right to Know</td>
<td>2</td>
<td>545</td>
<td>0.75</td>
<td>90</td>
<td>67.5</td>
<td>612.5</td>
</tr>
</tbody>
</table>

Worksheet 6: Estimation of Total Savings

| Total Savings            | $12,337                         | Visits              | 382.71                   | Time Savings         | 165               | Short Term Disability | 6584 |
| Total Savings            | $12,337                         | Workers Compensation| 2600                     | Educational Trainings| 2605              |                   |      |