

## Notes on Research Studies Relevant to Pathway

The tables below include research studies that found a favorable association between a variable that we interpret to be consistent with a Pathway characteristic and patient, nurse, or organizational outcomes.

### 1. Nurses Control the Practice of Nursing

<i>Study:</i>	<i>Pathway-relevant measure(s):</i>	<i>Associated outcome(s):</i>
Armstrong et al (2009) — 153 acute care staff nurses in Canada (registry sample)	nurse participation in hospital affairs (PES/NWI subscale)	safety climate
Kim et al (2009) — 192 RNs at 3 nonprofit, acute care, metropolitan hospitals in NY	nurse participation in hospital affairs (PES/NWI subscale)	quality of geriatric care (nurse- perceived)
Laschinger & Leiter (2006) — 8,597 acute care nurses in Ontario and Alberta (registry sample)	nurse participation in hospital affairs (PES/NWI subscale)	adverse events (nurse-reported frequency)
Manojlovich & Laschinger (2007) — 276 acute care nurses in Michigan (association list sample)	nurse participation in hospital affairs (PES/NWI subscale)	work satisfaction
Lavoie-Tremblay et al. (2011) —145 graduating nurses, Canada	subscales from the PES-NWI: <ul style="list-style-type: none"> <li>• nurse participation in hospital affairs</li> <li>• nursing foundations for quality care</li> </ul>	<ul style="list-style-type: none"> <li>• intent to quit current position</li> <li>• intent to quite the profession</li> </ul>
Gregory et al. (2010) — 548 acute care nurses, Canada	practice-related issues such as control/empowerment, input into decision making (in Revised Impact of Health Care Reform Scale)	perceived health care quality (combination of quality of care, standards of care, and safety issues)

## 2. The Work Environment is Safe and Healthy

<i>Study:</i>	<i>Pathway-relevant measure(s):</i>	<i>Associated outcome(s):</i>
Mark et al (2007) — approx. 4,000 nurses, 143 hospitals	safety climate measure (including job duties that allow for safe performance and management's attitude toward safety) in interaction with work conditions and engagement	<ul style="list-style-type: none"> <li>• back injuries</li> <li>• needlesticks</li> </ul>
Scott et al (2006) — 502 critical care nurses; 6,017 work shifts	(less) extended work shifts	<ul style="list-style-type: none"> <li>• nurse-reported errors</li> <li>• nurse-reported level of alertness</li> </ul>
Trinkoff et al (2007) — 2,273 nurses, 2 states (randomly selected licensed nurses)	hours worked per day, weekends worked per month, night shifts, 13+ hr days	needlestick injury (self-reported)
Trinkoff et al (2006) — 2,624 nurses, 2 states (randomly selected licensed nurses)	13+ hour/day, off-shifts, weekend work, work during time off, overtime/on-call	musculoskeletal injury/disorders
Vaughn et al (2004) — 1,454 healthcare workers (1047 RNs) in Iowa hospitals	organization standards and procedures, including infection control, precautions education, protective equipment, needleless IV, use of blood and body fluid precautions	consistent adherence to recap needles after use before disposing
Timmel et al. (2010) — 28 FT staff of an 18-bed surgery unit in Johns Hopkins	Comprehensive Unit-Based Safety Program Process (identify safety hazards; learn from defects; implement improvement tools; etc.)	safety climate scale, e.g., <ul style="list-style-type: none"> <li>• would feel safe here as a patient</li> <li>• encouraged by colleagues to report safety concerns</li> </ul>
Rosen et al. (2010) — 4581 VA hospital workers in 29 hospitals	overall emphasis on safety (subscale from Patient Safety Climate in Healthcare Organizations survey)	<ul style="list-style-type: none"> <li>• decubitus ulcer</li> <li>• iatrogenic pneumothorax</li> </ul>
Estryn-Behar et al. (2010) —1526 leavers vs 23,517 stayers in Belgium, Germany, Finland, France, Italy, The Netherlands, Poland, and Slovakia	among work environment conditions most frequently cited for leaving their institution: <ul style="list-style-type: none"> <li>• dissatisfaction with use of competence</li> </ul>	turnover

### 3. Systems are in Place to Address Patient Care and Practice Concerns

<i>Study:</i>	<i>Pathway-relevant measure(s):</i>	<i>Associated outcome(s):</i>
Mark et al (2007) — approx. 4,000 nurses, 143 hospitals	safety climate measure (including employee willingness to reveal errors and open communication about errors) in interaction with work conditions and engagement	<ul style="list-style-type: none"> <li>• back injuries</li> <li>• needlesticks</li> </ul>
Rosen et al. (2010) — 4581 VA hospital workers in 29 hospitals	subscales from Patient Safety Climate in Healthcare Organizations survey: <ul style="list-style-type: none"> <li>• fear of blame and punishment</li> <li>• psychological safety (comfort speaking, reporting concerns, questioning actions)</li> </ul>	<ul style="list-style-type: none"> <li>• decubitus ulcer</li> <li>• failure to rescue</li> </ul>
Chang & Mark (2011) —4954 RNs in 286 nonfederal, nonprofit hospitals	learning climate (willingness to reveal errors, open communication, active thinking about & diagnosing source of errors)	incident reports

### 4. Orientation Prepares New Nurses

<i>Study:</i>	<i>Pathway-relevant measure(s):</i>	<i>Associated outcome(s):</i>
Newhouse et al (2007) – more than 200 new graduate nurses hired by an academic institution	one-year intensive socialization/educational program to support new nurses in professional development and transition into nursing role	<ul style="list-style-type: none"> <li>• anticipated turnover</li> <li>• retention</li> </ul>
Scott et al (2008) – 329 nurses, North Carolina Center for Nursing data	length of orientation quality of orientation	<ul style="list-style-type: none"> <li>• new graduate nurse turnover</li> <li>• new graduate nurse job satisfaction</li> </ul>
Rudman & Gustavsson (2011) – 997 new nurses, Sweden	satisfaction with length and content of induction given at first employment	burnout

### 5. The Chief Nursing Officer is Qualified and Participates in all Levels of the Facility

<i>Study:</i>	<i>Pathway-relevant measure(s):</i>	<i>Associated outcome(s):</i>
Jones et al (2008) — 622 current and past CNOs	lack of power in role	intent to leave
Liu et al (2009) — 139,361 admissions to medical/surgical units at 125 VA medical centers	nurse executive line authority	lower nursing cost per admission

## 6. Professional Development is Provided and Utilized

<i>Study:</i>	<i>Pathway-relevant measure(s):</i>	<i>Associated outcome(s):</i>
Berarducci et al (2002) — 63 RNs, women’s health symposium in Florida	continuing education — lecture and slide presentation with Q & A based on National Osteoporosis Foundation guidelines	osteoporosis knowledge
Burns et al (1996) — 168 critical care nurses, 15 institutions, California metropolitan area	certification — critical care Registered Nurse (CCRN)	test on pulmonary artery catheters
Hall et al (2004) — 144 RNs (80 experiment)	participation in career planning and development program	<ul style="list-style-type: none"> <li>• career planning activities</li> <li>• career self-efficacy</li> </ul>
Hart et al (2006) — 256 nurses, 48 NDNQI hospitals	certification — wound/continence/ostomy	correct classification of pressure ulcers
Kendall-Gallagher & Blegen (2009) — 48 ICUs from a random sample of 29 hospitals	proportion of certified staff RNs in unit	annualized rate of falls
Kovner et al (2009) — 1,933 newly licensed RNs in 34 states (from state Boards of Nursing lists)	promotional opportunities (degree to which career structures are available to employees)	<ul style="list-style-type: none"> <li>• satisfaction</li> <li>• intent to stay</li> </ul>
Markert et al (2003) — 667 health care workers in 8 CME programs	continuing education — didactic presentations (e.g., gastroenterology, trauma, pain, Alzheimers, pain)	knowledge gains (6 programs)
Scarpaci et al (2007) — 47 nurses in 5 home-based hospice organizations in Maryland	certification — hospice	ability to demonstrate appropriate inhaler use
Zulkowski et al (2007) — 460 RNs	certification — wound care	test on pressure ulcer prevention, staging, and general knowledge
Estryn-Behar et al. (2010) —1526 leavers vs 23,517 stayers in Belgium, Germany, Finland, France, Italy, The Netherlands, Poland, and Slovakia	among work environment conditions most frequently cited for leaving their institution: <ul style="list-style-type: none"> <li>• dissatisfied with development opportunities</li> </ul>	turnover

## 7. Competitive Wages/Salaries Are In Place

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<i>Study:</i>	<i>Pathway-relevant measure(s):</i>	<i>Associated outcome(s):</i>
Lum et al (1998) — 361 nurses	pay satisfaction	turnover intent
Estryn-Behar et al. (2010) —1526 leavers vs 23,517 stayers in Belgium, Germany, Finland, France, Italy, The Netherlands, Poland, and Slovakia	among work environment conditions most frequently cited for leaving their institution: <ul style="list-style-type: none"><li>• dissatisfaction with pay</li></ul>	turnover

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## 8. Nurses Are Recognized for Achievements

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<i>Study:</i>	<i>Pathway-relevant measure(s):</i>	<i>Associated outcome(s):</i>
Tourangeau et al (2006) — 6,856 RNs and 1,325 RPNs in Ontario, Canada	satisfied with praise and recognition received at work	remain employed in current hospital
Jourdain & Chenevert (2010) — 1636 RNs working in hospitals, Canada	<ul style="list-style-type: none"><li>• recognition by physicians</li><li>• recognition by patients</li></ul>	intent to leave the profession (through depersonalization)

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## 9. A Balanced Lifestyle is Encouraged

<i>Study:</i>	<i>Pathway-relevant measure(s):</i>	<i>Associated outcome(s):</i>
Penz et al (2008) — 944 Canadian RNs in rural hospitals	scheduling satisfaction, including # hrs worked, scheduling flexibility, shifts worked, overtime	job satisfaction
Rosenfeld et al (2008) —New York City subsamples from 1996 (n=309), 2000 (n=550), and 2004 (n=368) National Sample Survey of RNs	children at home	<ul style="list-style-type: none"> <li>• less likelihood to work in hospitals (compared to other settings)</li> <li>• less likelihood to work full-time (compared to part-time)</li> </ul>
Stone et al (2006) — 805 nurses, 99 units, 13 New York City hospitals	12 hour shifts (compared to 8 hour shifts)	<ul style="list-style-type: none"> <li>• job satisfaction</li> <li>• schedule satisfaction</li> <li>• (less) emotional exhaustion</li> </ul>
Wilkins & Shields (2009) — 2,993 nurses (weighted to represent Canada's 91,600 RNs)	employer-provided support programs: <ul style="list-style-type: none"> <li>• child care assistance</li> <li>• fitness or recreation</li> </ul>	job satisfaction
Jourdain & Chenevert (2010) — 1636 RNs working in hospitals, Canada	work interference with family	intent to leave the profession (through emotional exhaustion)
Estryn-Behar et al. (2010) —1526 leavers vs 23,517 stayers in Belgium, Germany, Finland, France, Italy, The Netherlands, Poland, and Slovakia	among work environment conditions most frequently cited for leaving their institution: work schedule difficulties work-family problems	turnover

## 10. Collaborative Interdisciplinary Relationships are Valued and Supported

<i>Study:</i>	<i>Pathway-relevant measure(s):</i>	<i>Associated outcome(s):</i>
Armstrong et al (2009) — 153 acute care staff nurses in Canada (registry sample)	collegial nurse-physician relations (PES/NWI subscale)	safety climate
Bratt et al (2000) — 1,973 RNs in 65 pediatric acute care institutions	nurse-physician collaboration (8 Likert items)	<ul style="list-style-type: none"> <li>• professional job satisfaction</li> <li>• organizational work satisfaction</li> </ul>
Estabrooks et al (2005) — 18,142 patients discharged from 49 acute care hospitals and 4,799 surveyed RNs	nurse-physician relationships (NWI-R subscale)	30-day mortality
Gittell et al (2000) — 338 care providers (including nurses and physicians) from 9 hospitals, 878 orthopedic patients	mutual respect, shared goals, and frequency of communication (dimensions of “relational coordination”)	<ul style="list-style-type: none"> <li>• length of stay</li> <li>• quality of care</li> <li>• postoperative freedom from pain</li> <li>• postoperative functioning</li> </ul>
Kovner et al (2009) — 1,933 newly licensed RNs in 34 states (from state Boards of Nursing lists)	collegial RN-MD relations	satisfaction
Laschinger & Leiter (2006) — 8,597 acute care nurses in Ontario and Alberta (registry sample)	collegial nurse-physician relations (PES/NWI subscale)	adverse events (nurse-reported frequency)
Manojlovich & Laschinger, (2007) — 276 acute care nurses in MI (association list sample)	collegial nurse-physician relations (PES/NWI subscale)	work satisfaction
Wade et al (2008) — 731 nurses, in a large mid-Atlantic health system	collegial nurse-physician relations (PES/NWI subscale)	job enjoyment
Wilkins & Shields (2009) — 2,993 nurses (weighted to represent Canada’s 91,600 RNs)	nurse-physician relations (NWI-R subscale)	job satisfaction

## 10. Collaborative Interdisciplinary Relationships are Valued and Supported — continued

<i>Study:</i>	<i>Pathway-relevant measure(s):</i>	<i>Associated outcome(s):</i>
Lavoie-Tremblay et al. (2011) —145 graduating nurses, Canada	collegial nurse-physician relations (PES/NWI subscale)	<ul style="list-style-type: none"> <li>• intent to quit current position</li> <li>• intent to quit the profession</li> </ul>
Gregory et al. (2010) —548 acute care nurses, Canada	collaborative relations (items assessing interdisciplinary relations)	perceived health care quality (combination of quality of care, standards of care, and safety issues)
Lewis & Malecha (2011) —650 RNs, Texas	(higher) scores on Nursing Incivility Scale (inconsiderate & inappropriate workplace behavior from nurse, supervisor, physician, etc.)	productivity measured as degree of interference in performing role
Jourdain & Chenevert (2010) —1636 RNs working in hospitals, Canada	hostility from physicians (and patients)	intent to leave the profession (through emotional exhaustion)

## 11. Nurse Managers are Competent and Accountable

<i>Study:</i>	<i>Pathway-relevant measure(s):</i>	<i>Associated outcome(s):</i>
Armstrong et al (2009) — 153 acute care staff nurses in Canada (registry sample)	nurse manager ability, leadership, and support (PES/NWI subscale)	safety climate
Cohen et al (2009) — 453 RNs in 2 acute care hospitals in northern California	supervisory support	nurse retention
Kovner et al (2009) — 1,933 newly licensed RNs in 34 states (from state Boards of Nursing lists)	supervisory support	satisfaction
Laschinger & Leiter (2006) — 8,597 acute care nurses in Ontario and Alberta (registry sample)	nurse manager ability, leadership, and support (PES/NWI subscale)	adverse events (nurse-reported frequency)
Manojlovich & Laschinger (2007) — 276 acute care nurses in MI (association list sample)	nurse manager ability, leadership, and support (PES/NWI subscale)	work satisfaction
Taunton et al (1997) — 95 middle managers and 1,171 staff nurses in 4 midwestern acute care hospitals	manager consideration scale (including fairness, regard for wellbeing and contribution of staff, and helping work group members develop skills)	retention
Vogus et al (2007) — 1033 RNs and 78 nurse managers, 10 health system hospitals	trust in manager (manager reputation for fairness dealing with nurses and manager demonstration of integrity)	medication errors
Wade et al (2008) — 731 nurses, in a large mid-Atlantic health system	nurse manager ability, leadership, and support (PES/NWI subscale)	job enjoyment
Lavoie-Tremblay et al. 2011 —145 graduating nurses, Canada	subscales from the PES/NWI <ul style="list-style-type: none"> <li>• nurse manager ability</li> <li>• leadership &amp; support of nurses</li> </ul>	intent to quit the profession
Gregory et al. (2010) —548 acute care nurses, Canada	emotional climate (including management & peer support, open communication in Revised Impact of Health Care Reform Scale)	perceived health care quality (combination of quality of care, standards of care, and safety issues)

## 11. Nurse Managers are Competent and Accountable — continued

<i>Study:</i>	<i>Pathway-relevant measure(s):</i>	<i>Associated outcome(s):</i>
Jourdain & Chenevert (2010) —1636 RNs working in hospitals, Canada	support from supervisor (reflecting emotional, esteem, and instrumental support)	Intent to leave the profession
Van der Heijden et al. (2010) —17524 nurses in hospitals and nursing homes in Belgium, Germany, Finland, France, Italy, The Netherlands, Poland, and Slovakia	social support from direct supervisor (evaluates work & results, ready to help, supportive advice)	intent to leave in 3 of 8 countries (Finland, Italy, and Poland)

## 12. A Quality Program and Evidence-Based Practices are Utilized

<i>Study:</i>	<i>Pathway-relevant measure(s):</i>	<i>Associated outcome(s):</i>
Titler et al (2008) — 669 hospitalized older adults in 12 midwest acute care hospitals	intervention of evidence-based pain management practices	mean pain intensity
Brooks et al (2008) — 1578 patients in 12 midwest acute care hospitals	intervention of evidence-based pain management practices	total cost per inpatient stay, cost per day, and length of stay
Timmel et al. (2010) —28 FT staff of an 18-bed surgery unit in Johns Hopkins	Comprehensive Unit-Based Safety Program Process: identify safety hazards; learn from defects; implement improvement tools; etc.	improvement in teamwork climate

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