

Effects of Acuity-Adaptable Rooms

Based on the article Effects of Acuity-Adaptable Rooms on Flow of Patients and Delivery of Care by Ann L. Hendrich, RN, MS, Joy Fay, RN, MS, and Amy K. Sorrells, RN, BSN

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imagination at work

Course description:

The use of acuity-adaptable rooms designed to provide coronary critical care and medical step-down services can improve the flow of patients and promote the more efficient use of nursing resources.

This presentation reviews the research by Hendrich, Fay and Sorrells that tested the effectiveness of using acuity-adaptable rooms on a new unit on the flow of patients, the satisfaction of patients, the frequency of sentinel events, the mean length of stay in the hospital, and the allocation of budgeted nursing care hours.

Learning outcomes:

At the end of this session the participant will be able to:

- Explain the concept of acuity-adaptable room
- Identify the five key areas of investigation in this research study
- Describe benefits of the acuity-adaptable room based on this research study

Trend in most US hospitals

“Bottlenecks” in the flow of patients heightened by:

- Severe shortage of nurses
- National increase in use of EDs
- Marked increase in hospital occupancy rates

“Bottlenecks” in the flow of patients

- Reached epidemic proportions
- At times require tedious and even life-threatening diversions from hospitals and EDs
- Delay appropriate assignments of patients to beds
- Frequently staff and administration is torn between putting a patient in the hallway of the ED without appropriate nursing care or equipment-or diverting the patient to another hospital and delaying the patient’s care

Article focus

Flow of patients

- Models of care that offer significant opportunity to solve this problem

Background

Patient flow - defined as how hospitals transfer patients between nursing units, and is influenced by the levels of care required and the severity of patients' conditions

Traditional nursing units

Organized around diagnosis type

- Diagnosis type is primary predictor of bed assignments

Levels of care influenced primarily

- Headwall in room capability required for multiple gases, lines, and outlets
- Clinical specialty skills of the nurse
- Historical variable reimbursement levels by the Centers for Medicare and Medicaid Services

Traditionally in order for patients to receive level of care matching their varying acuity

- Move 3 to 6 times during their short stay
- Results of the frequent moves
 - Missed or delayed treatments
 - Medication errors
 - Patient falls
 - Individual contact with as many as 50-100 caregivers or allied health professionals

Today tools to measure acuity and workload are used

- Calculation of weighted measures for patient's acuity is converted to a workload index
- Most nursing departments budget and plan the number of nursing hours per patient day (NHPPD)
- Typical nursing unit may transfer or discharge 40% - 70% of its patients every day
- A Reasonable workload index is a key predictor of retention

Distinction of the critical care and medical-surgical care units is not as clear today

- Over the past 10 years increasing acuity of patients
- Progressive care, telemetry, intermediate, step-down units have evolved for “low-risk monitored patients”

Progressive care units

- Require short – term ventilation
- Infusions of vasopressors
- Physiological monitoring
- Altered levels of consciousness
- Altered level of fluid status
- Hypertensive crisis
- Gastrointestinal hemorrhages
- Drug overdoses

Nurse staffing

- Progressive Care Units
- Nurse staffing is a 1:2 ratio
- Mirrors the NHPPD for critical care units (19-20 NHPPD)
- Challenges the efficiency and productivity of small progressive care units 4-12 beds

Progressive care units

- Number of patients requiring this care increased sharply in the past 10 years
- Growth is consistent and measurable
- Suggests need for additional and flexible rooms
- Possible solution is acuity-adaptable rooms

What happens when progressive care units are full

- Patient with mid-level acuity is placed in a critical care unit
- Frequently a significant number of patients in the critical care unit are low risk but require monitoring

Problem of patient flow and hospital capacity

- Multifaceted
- Externally driven
 - Aging population
 - Migration of short-stay (less acutely ill) patients from tertiary hospitals
 - New technologies
 - Compressed higher acuity lengths of stay

Small incremental improvements achieved for short-term

- Targeting bed placement
- Communication
- Housecleaning efficiency

For long-term success and future delivery of care

- Examine medical-surgical specialty part of patient flow

Physician's decision: patient placement

- NHPPD critical care units 19 - 20
- NNPPD medical surgical units 5 – 6.5
- Primary factor for patient placement

Concern nursing practice and patient safety

- High-acuity patients placed in the medical-surgical units
- Opt to place patients in beds designed for higher acuity
- Results in short-stays, multiple transfers, discharges home

Short stays, multiple transfers, discharges to home

- Increased Workload Status
- Poor utilization human and fiscal resources
- Lack of available beds in the critical care unit
 - Safety concerns
 - Delays in placement of patients
 - Transfers of high-acuity patients
- Driving force Cardiac Comprehensive Critical Care (CCCC)

Methods: literature review

Two studies at British Columbia Women's Hospital

- Satisfaction of staff and patients was greater when the patient remained in a single room throughout the entire hospital stay (for low-risk obstetric admissions)
 - Provision of information and support
 - Physical environment
 - Nursing care
 - Education of patients
 - Assistance with infants' feedings
 - Respect for privacy
 - Preparation for discharge
 - Increased overall satisfaction with the work environment

Janssen PA, Harris SJ, Soolsma K, Klein MC, Seymour LC, Single room maternity care: the nursing response. Birth. 2001;28:173-179.

Janssen PA, Klein MC, Harris SJ, Soolsma K, Seymour LC, Single room maternity care and client satisfaction. Birth. 2000;27:235-243.

Literature review additional studies

Besserman et al tested use of an alternative flexible approach to traditional fixed intermediate and intensive care to minimize transfer of patients

- Increase direct admissions to flexible intermediate care
- No overall change in admissions to the intensive care unit
- Fewer patients needed conventional mechanical ventilation
- More patients in both units could be treated with noninvasive ventilation
- Length of stay decreased
- Mortality decreased
- Cost savings

Besserman E, Teres D, Logan A et al. Use of flexible intermediate and intensive care to reduce multiple transfers of patients. Am J Crit Care 1999;8:170-179.

Literature review additional studies

Besserman et al cont.

- For one hospital
- Decreased length of stay
- Cost savings more than \$3 million in the first year of implementation

Besserman E, Teres D, Logan A et al. Use of flexible intermediate and intensive care to reduce multiple transfers of patients. Am J Crit Care 1999;8:170-179.

Planning for evidence-based design

- The Methodist campus of Clarian Health, Indianapolis, Indiana had an urgent need for additional bed capacity because of consolidation in mid-1990s
- Highly aware of problem of patient flow
- 2 floors of shell space for nursing units
- Opportunity to combine current knowledge with long-term, futuristic view of care models for progressive and critical care

Planning for evidence-based design

- Interdisciplinary team planning and process
- Blend of continuous quality improvement
- Principles and systems thinking
- Integrated with evidence from the literature

Planning for evidence-based design

Study 1

- 1000-hour video
 - Time and motion on a medical-surgical unit
 - Simultaneously detailed all activities in the patient's room, hallway and nurses station

Study 2

- Direct observational study of the transport of patients

Planning for Evidence-Based Design

Conclusions:

- Caregiver environment-workload index (including transfer of patients)
- Ergonomics such as reach and distance to perform care tasks and equipment location
- Expert in designing environments to promote healing worked with staff to plan to improve
 - Lighting
 - Colors
 - Air quality
 - Warmth
 - Patient's privacy
- Focus groups of patients used throughout the design process

Planning for evidence-based design

Discussions with the Joint Commission on accreditation for healthcare organizations and the state department of health

Unanticipated barrier HCFA guidelines

- These guidelines define critical care and guide the billing standards that create limits about charging different amounts for the same bed according to the type of care that is provided
- Variable rates generally cannot be used for beds designated as critical care

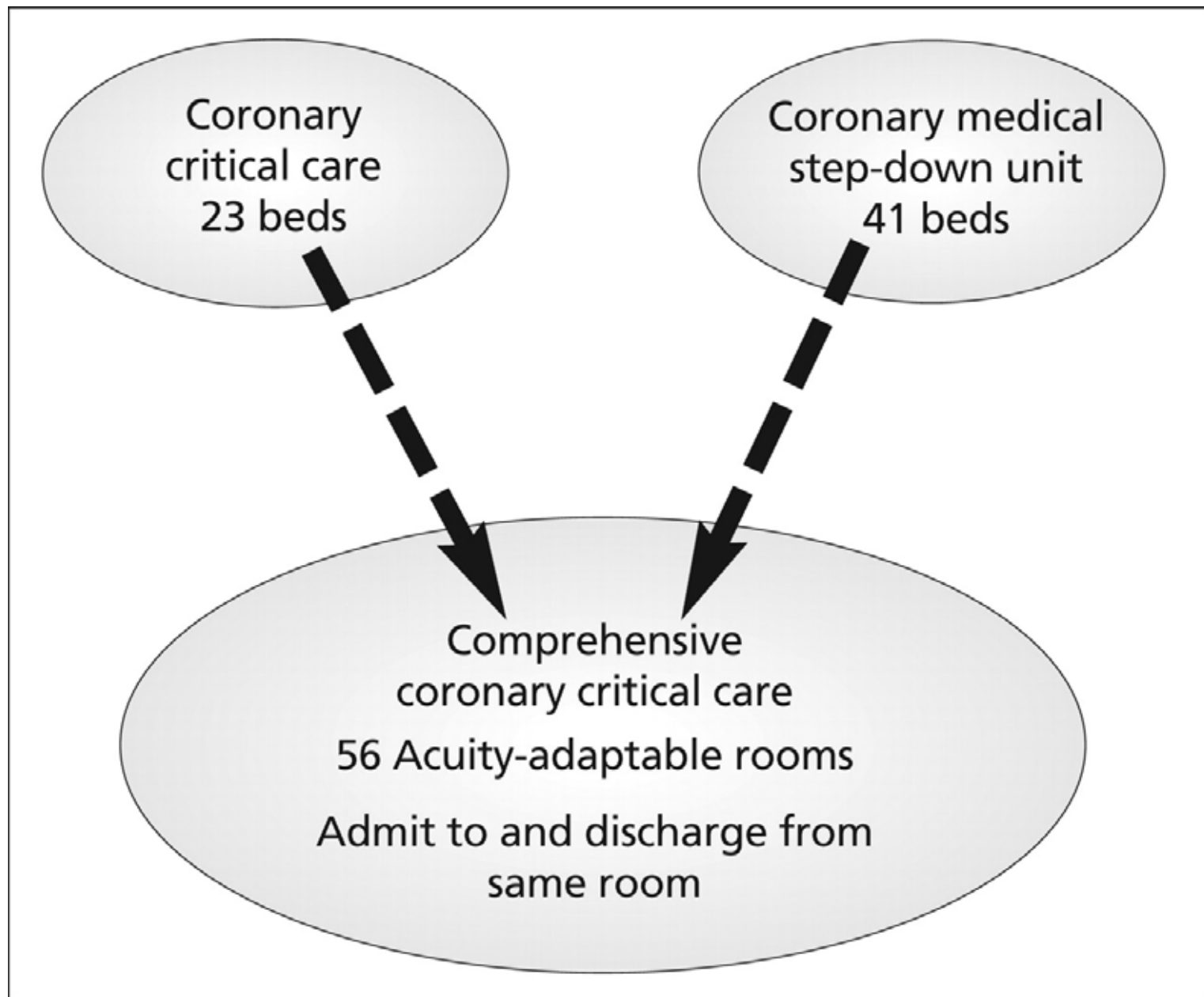
Planning for evidence-based design

HCFA appeal process used to reach solution

- Specific acuity criteria for variable-rate billing and written physicians' orders for discharging from one level of acuity to another

Choosing the patient population to be coronary critical care and its step-down medical unit based on:

- Consolidation needs
- Characteristics of the bottleneck
- Need for population with fairly predictable clinical course



Planning for evidence-based design

Overall design of the CCCC demonstration project

- Eliminate resources waste (caregiver and fiscal)
- Improve the caregivers' work environment and personal satisfaction
- Create an exceptional patient care experience
- Provide a balance with characteristics of a healing environment
- Support future delivery of care while solving problems with the flow of patients

Planning for evidence-based design

Shift indirect time back to the nurses and patients' care by reducing steps

- Obtain supplies
- Reduce transfers of patients
- Rework care delivery model
- Minimize delays for patient placement and waits in holding areas
- Eliminate equipment duplication
- Maximize technology for efficiency
- Information for patients and caregivers readily available at the point of care

Planning for evidence-based design

Development of a preeminent healing environment and experience for patients was a high priority

- Additional space planned for a family area to provide rest and comfort for patients, their families and significant others and prevent clinical complications
- High tech, user friendly approach to the education of patients and families to encourage prevention and self-care

Final design - CCCC opened fall 1999

- Preeminent care unit balance with healing characteristics
- 56 acuity-adaptable rooms (28 per floor)
- Additional treatment room on each floor
- Warm atmosphere without sacrificing staff access to technology and medical needs
- Within 3 years recognized as critical care award winner by American Association of Critical Care Nurses, the Society for Critical Care Medicine and the American Institute of Architects
- New standards for high-tech, holistic care

Final design – Patient Room 400 sq ft

Family zone

- Chair-bed, refrigerator, computer hookup, voice mail, TV/VCR

Patient zone

Caregiver zone

Customized educational kiosks and computer-based education

- Orients patients and families to the unit
- Provides source for education individualized for each patient

Transforming (acuity-adaptable) headwalls

Advanced computer technology on the patient's bed to record body weight and other vital data



Final design – Waiting Areas

Designed to provide more soothing features

- Indoor garden
- Aquarium
- Kitchenette
- Small lockers



Final design – Staff Area

Designed to provide more convenience for the staff

- Necessary supplies in each patient's room
- Decentralized nursing stations with computer access and servers for supplies
- Additional work space for caregivers just outside each patient's room
- Corridor design allows for emergency equipment such as defibrillators to be hidden behind doors
- Computerized education center for access to information and training materials
- Staff lounge for relaxing, private shower, bathroom and lockers

Final design

- 24-hour visitation policy
- Convenient supply rooms
- Personal paging
- Identification tracking system to pinpoint staff locations



Data collection

To assess the impact of this acuity-adaptable demonstration project clinical and financial measures were measured before and after the move

List of 12 questions or areas of inquiry

- (7 are reported here)

Areas of inquiry

1. Will the CCCC patients have fewer complications (adjusted for severity) when compared with a baseline cohort of matched patients? Will the mortality index change?
2. Will the sentinel event index rates decrease within the CCCC (eg, falls, medication errors, complaints)?

Areas of inquiry

3. Compared with baseline data, will satisfaction increase among clinicians as a result of key interventions (technology, environment, care delivery model)? Will the measures change over time (3, 6, 12, 24 months)?
4. Will patients' satisfaction levels be higher than they were in the baseline data set?

Areas of inquiry

5. Will recruitment and retention of nurses improve in a CCCC environment?
6. What market impact can be measured or quantified with payer, patient, physician or patient's family? Would patients recommend the CCCC to others?
7. Compared with the baseline data, will the costs of labor (direct, nondirect and fixed) be reduced with the environment, technology and care delivery model?

Related variables

- Case mix index
- Patient acuity
- Carefully compared to ensure that beneficial and adverse changes from the baseline could be detected

Sentinel events were tracked continuously (medication errors and patients' falling)

- Because of commonality and potential adverse effect on quality of care and patients' outcomes
- Monthly index used to track rates before and after the move
- Index is sensitive to shifts in the number of days patients are in the unit which could account for more or less opportunity for errors to occur

Patients' reactions

Measured with the Patient Expectation Project standardized tool

Patients levels of satisfaction and dissatisfaction before and after the move were compared

Tool

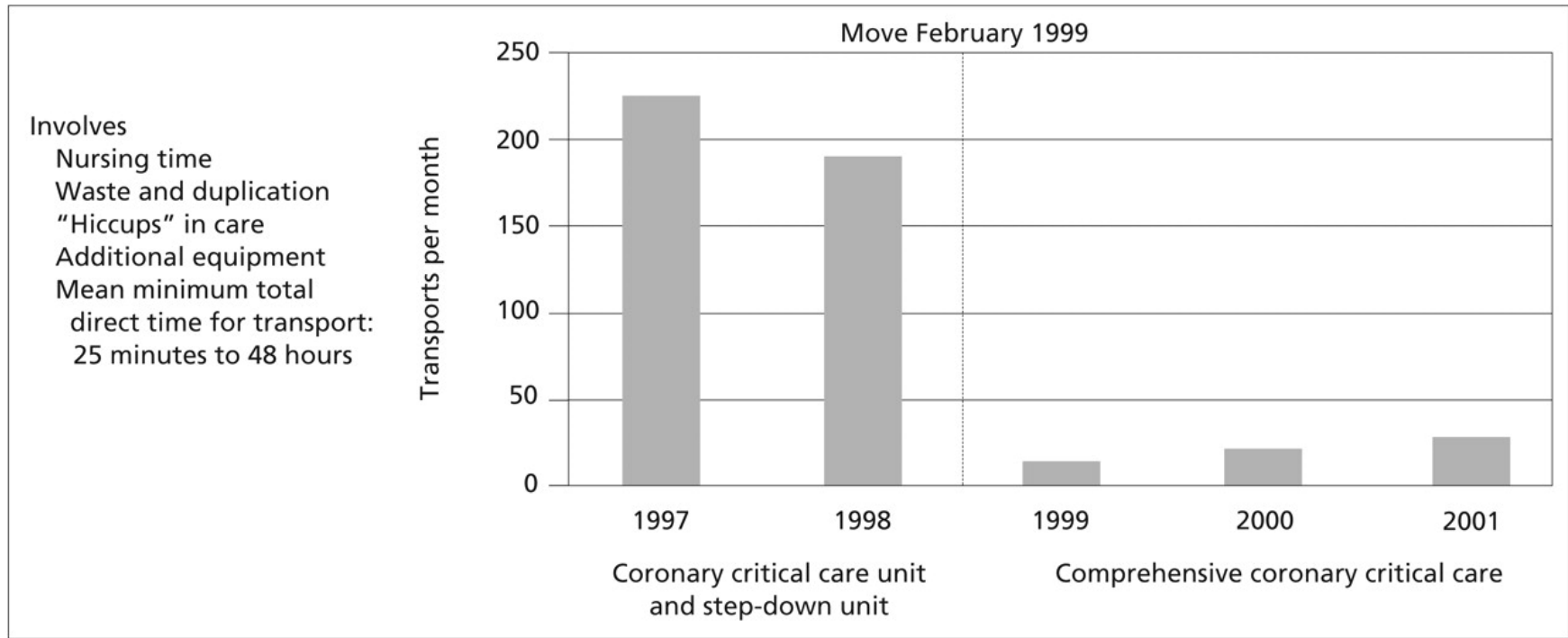
- Measures how closely patients' experiences met their expectations
- Key factors that predict patients' overall willingness to choose the hospital again or to recommend it to family and friends
- Factors statistically weighted as to importance
- Relative values assigned

Results

Before move the Coronary critical care unit and the step-down unit had a mean of more than 200 intraunit transfers each month

- Time required is nonvalue added time as related to providing direct care and the patients' outcome
- Transport interrupts the care plan and can even introduce errors

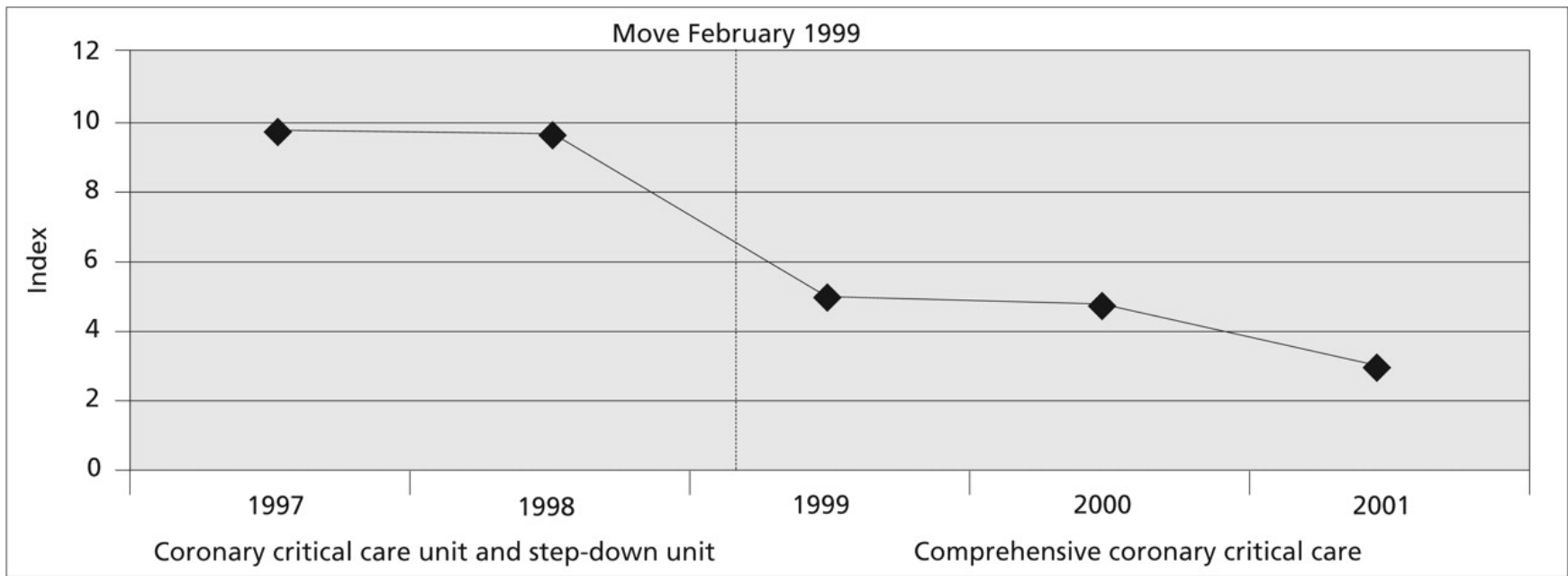
After the move to the CCCC transports reduced by more than 90%



Results

Reduction of 70% in medication errors occurred after the move

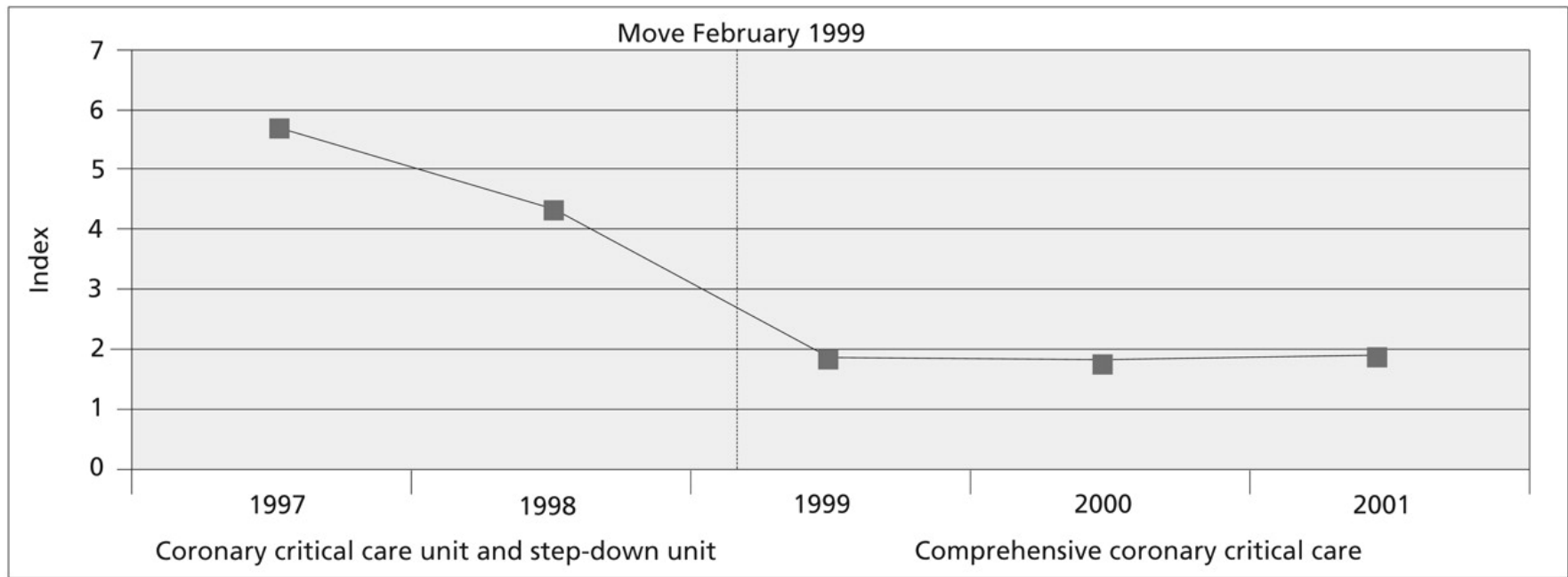
- Large reduction in hand -offs among clinicians
- Near-elimination of transfers
- Simplification of work for caregivers are thought to directly correlate with the reduction in the medication error index



Results

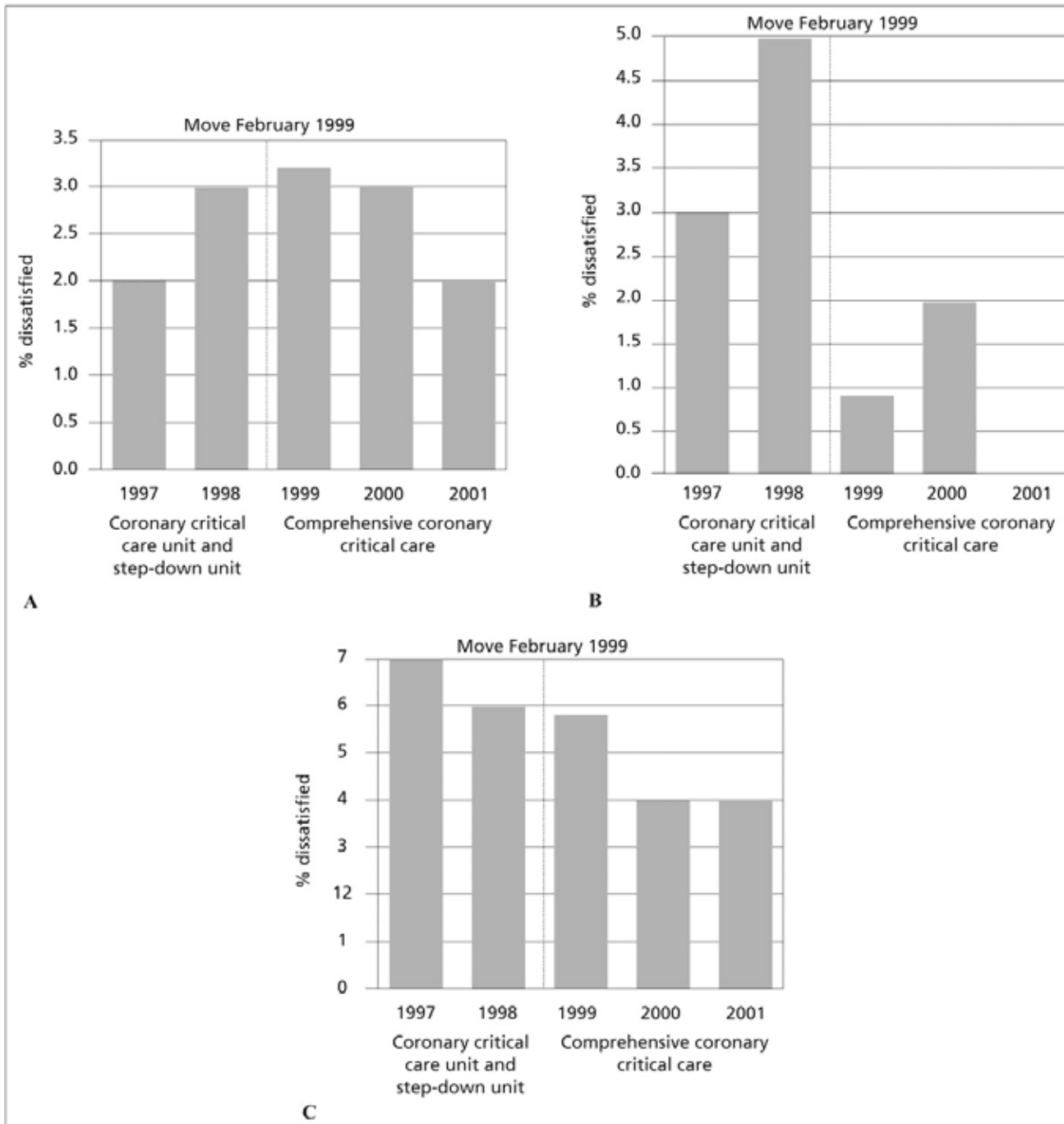
Fall index for the cardiac population (a high-risk group) moved to national benchmark level of 2 falls per 1000 patient days

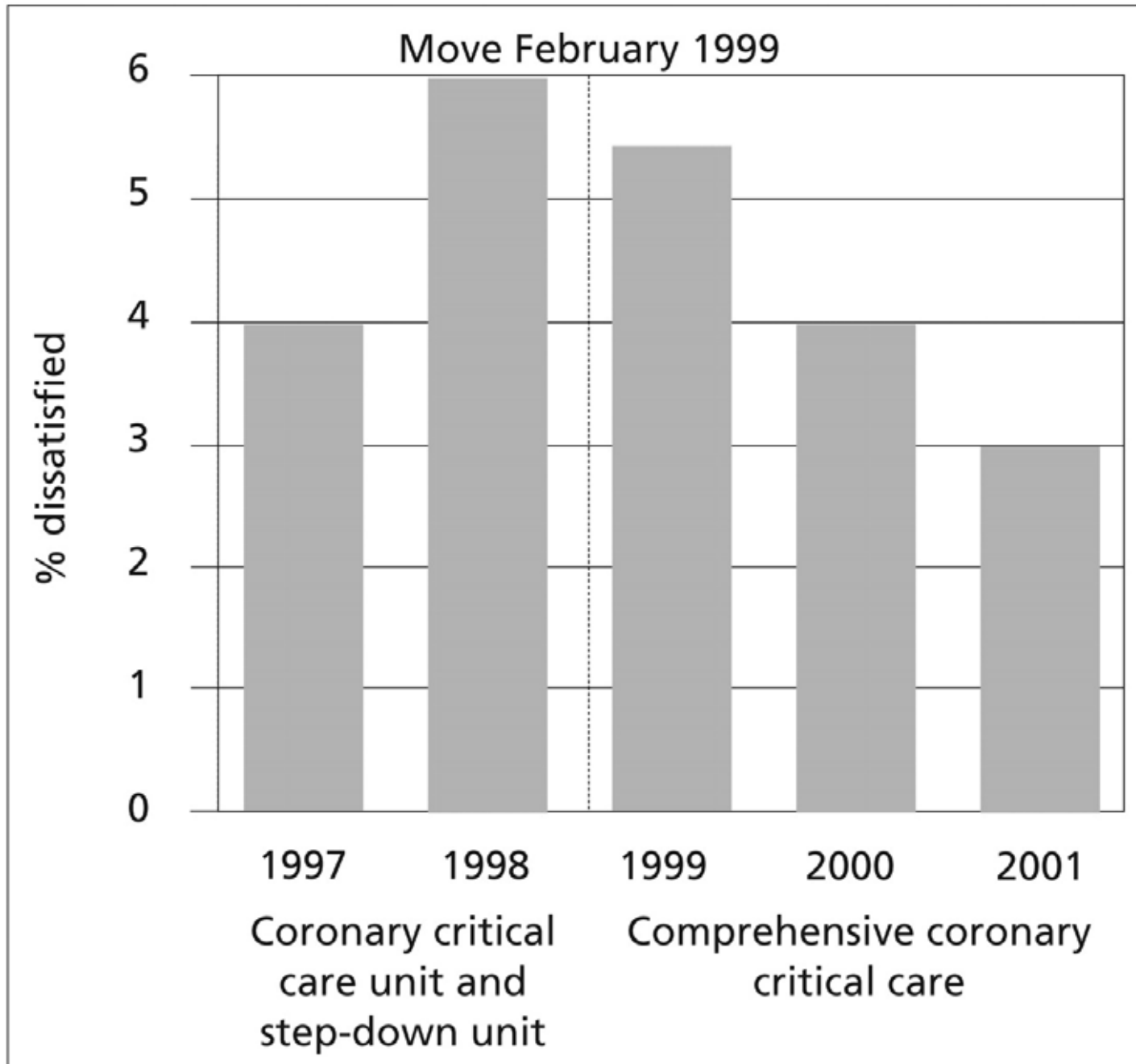
- Patient falls
 - Most patients fall while in the room
 - Fall is usually related to elimination needs
- Design of the unit placed decentralized nursing stations just outside a patient's room
 - Increases the time available to meet the needs of the patients
 - Decreases the time and distance nurses must go to help patients



Results

Patient dissatisfaction levels decreased significantly (3% decline in overall dissatisfaction in the 3 years after the move)





Results

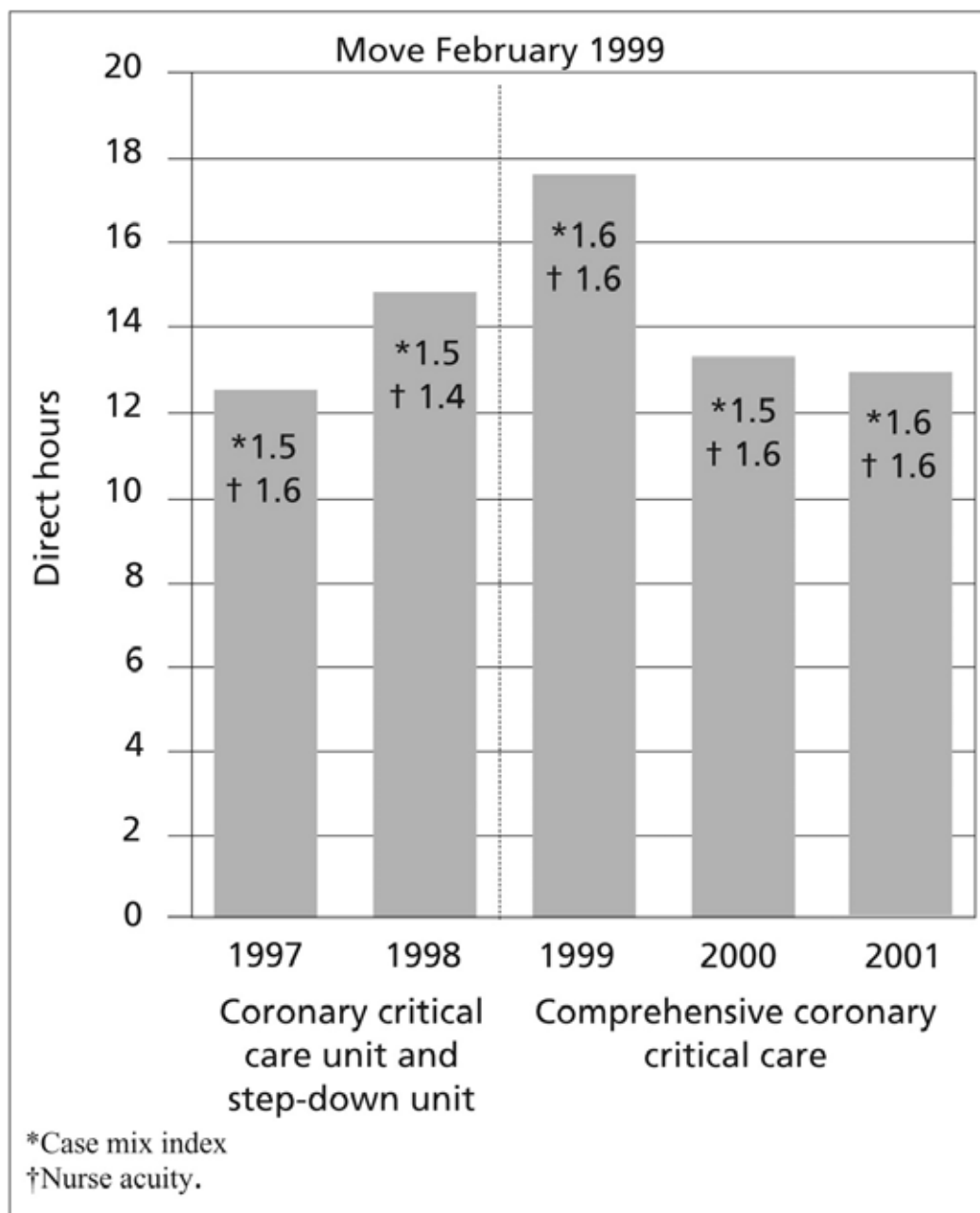
NHPPD levels returned to those used to staff the units in 1997

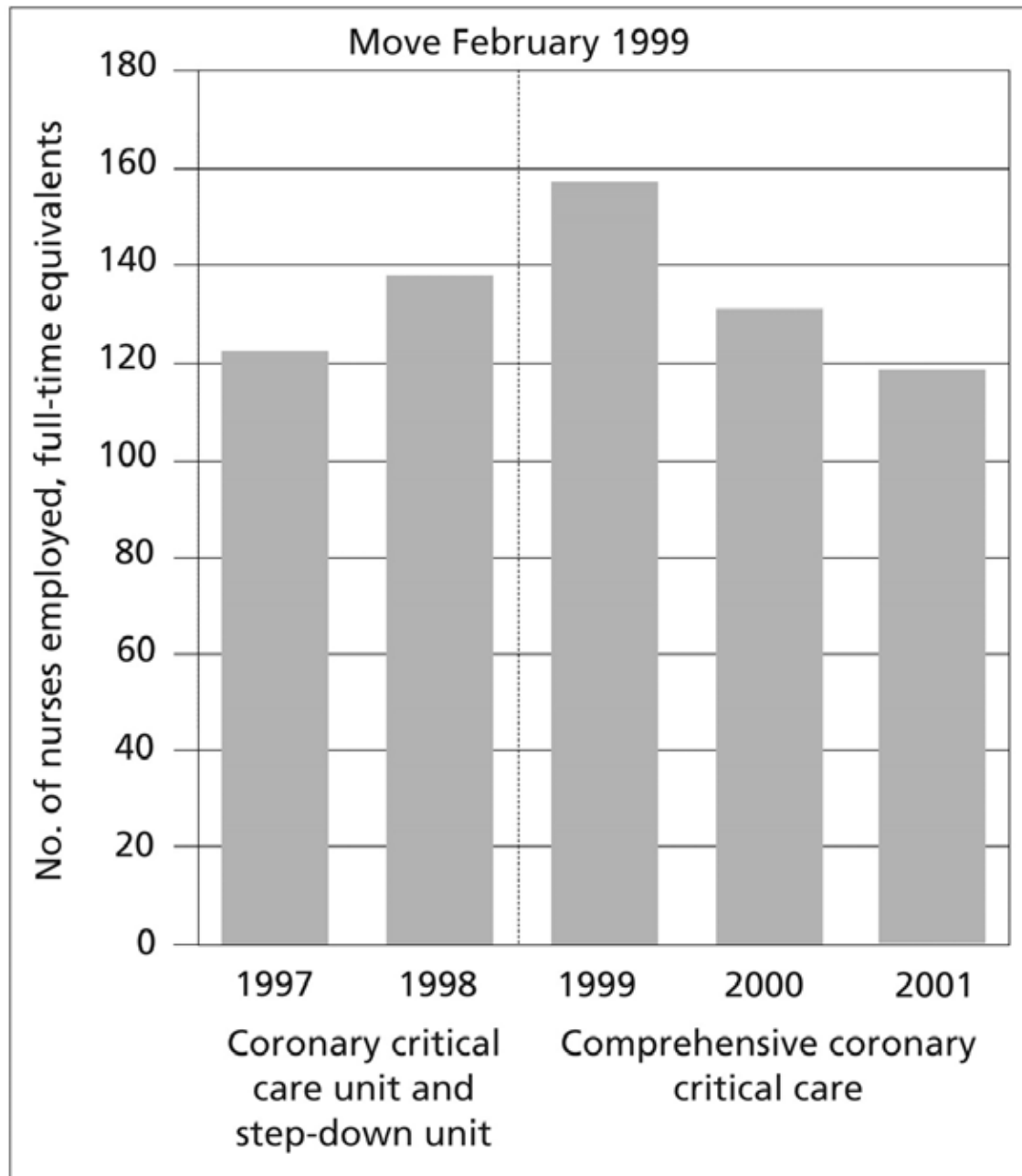
Reducing the NHPPD was never a stated goal but the intent was to improve how nurses' time was spent and to remove the inefficiencies and rework

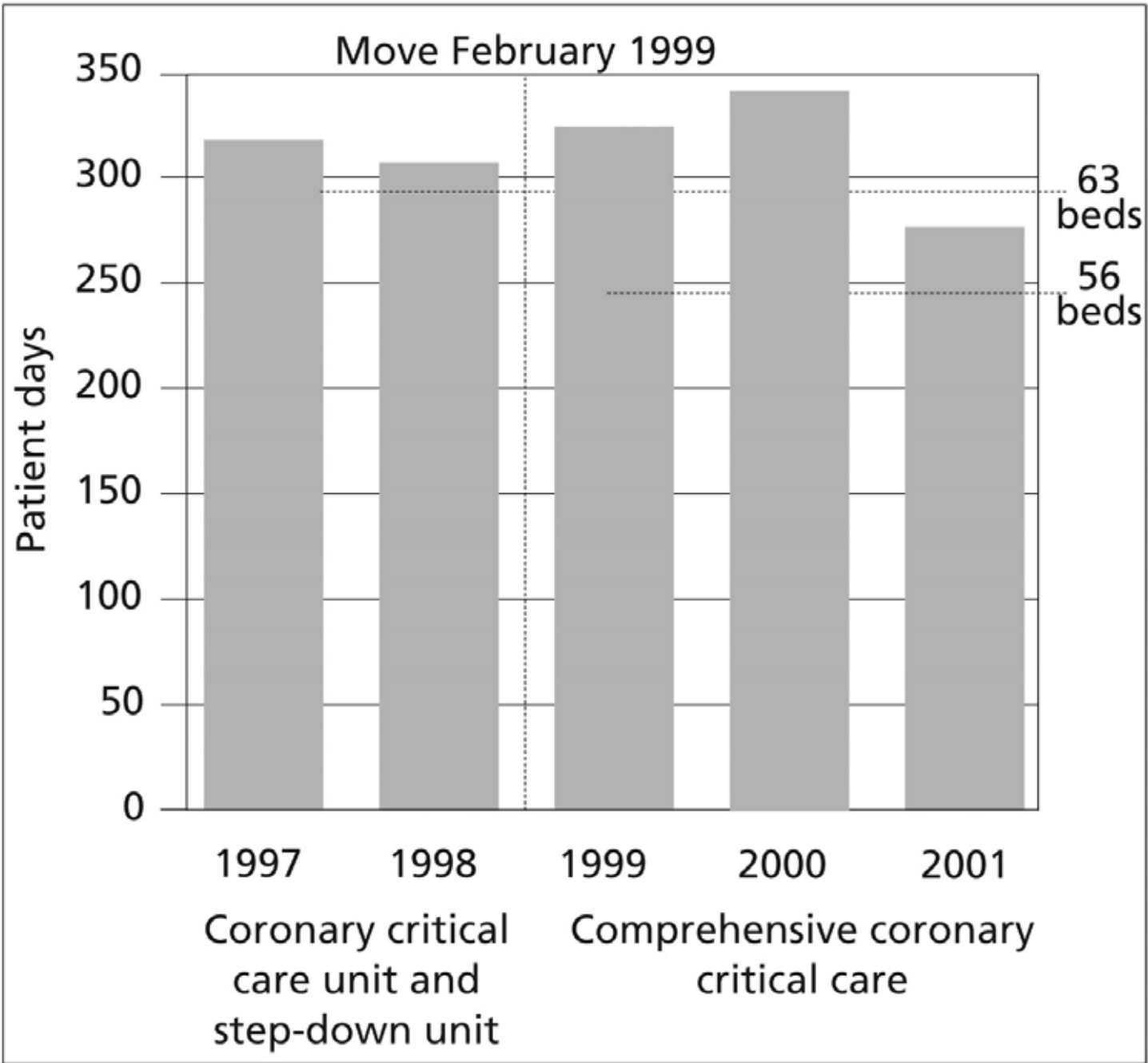
- Increased available nursing time
- Permitted reduction in budgeted staffing care hours

Help reverse the rising shortage of nurses

Available nursing hours are directed toward patients rather than waste and inefficiencies in the environment







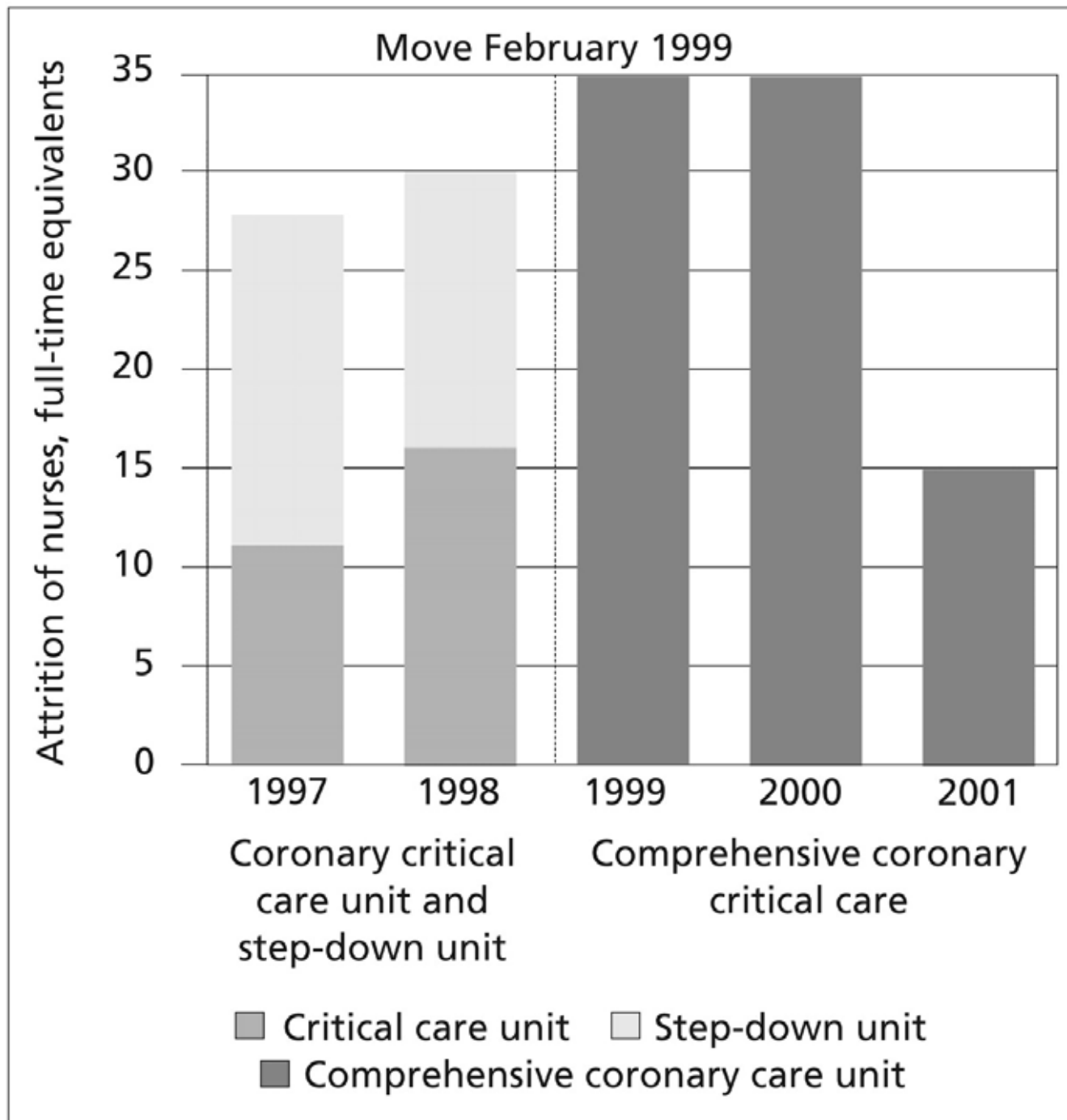
Results

Staff turnover-some occurred in the first year

Staff turnover stabilized in years 2-3

Initially critical care nurses expressed concerns

- Isolationism because of the decentralized work areas
- Sense of loss over the traditional critical care unit
 - Limited visitation
 - Controlled access of patients' family members
 - Pure critical care staff mode



Discussion

The root cause of bottlenecks in the flow of patients should be considered during the planning for renovation and new hospital projects

New designs will require new delivery models to match specialty nursing skills against patients' needs

Discussion

Future-based designs should include:

- Finding ways to conserve critical care beds for super-acute areas
- Adding medical-surgical acuity adaptable beds to the complement
- Creating consolidated acuity-adaptable beds for post-anesthesia care units and interventional/special procedure areas

Discussion

Underuse of technology

- Newness of technology
 - Nursing call lights used infrared scanning capable of locating each nurse but nurses still walked from room to room looking for another nurse
- Important to assist staff in accepting technology as a tool rather than perceiving it as an obstacle

Discussion

Healing environment characteristics

- Caused anxiety for some staff members
- Size of the unit and decentralized nursing stations
 - Sense of isolationism
 - Promotion of more autonomous decision making
- Ongoing education

Summary

US healthcare struggling to respond to the described trends while also meeting new standards and expectations from groups such as Leapfrog and the Institute of Health

Hospital designs or renovations for the future patterned after the CCCC can effectively contribute to more efficient and safe delivery of care when all clinicians are involved

Summary

Future delivery of care will be strategic if disease management and community-based models are combined with new, more efficient hospital designs to add beds when needed yet to conserve nursing and healthcare labor resources

Significant opportunity for organizational innovation and change for the good of patients, caregivers and an ailing healthcare delivery system