

# Development of the Transitional Care Program and its Effect on Patients discharged from the Intensive Care Units

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# Introduction

# Background

- Transitional care
  - continuity of nursing care when the ICU patients are transferred to the general wards
  - adapt to a new environment

## Patients and family caregivers

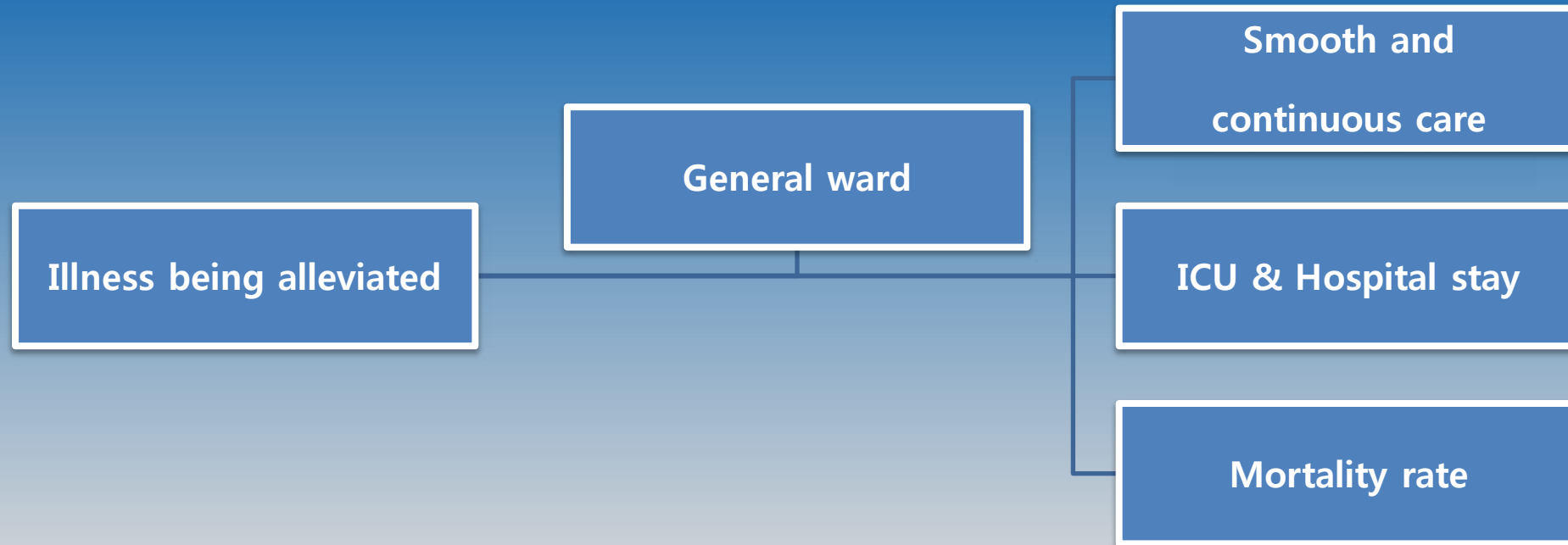
- Feel lost among the intensive environment and medical staff personnel
- Anxiety and uncertainty of life
- Unrealistic expectations of ward staff

## Staff

- Information is not pertinent to the care receiving patients from ICU
- Not consider the skill mix on the general wards and the workload of the staff

## Environment

- Provide care at a level intermediate between the ICU and the general ward is not enough
- The complexities of the clinical environment
- A busy clinical environment



- Developing transitional care and appropriate nursing intervention skills are very essential

# Outcome studies : International

- Established a unit which provides the intermediary role between the ICU and general ward

Study	Design	Intervention	Effect on patients outcomes	Effect on nurses of ICU/wards
Chaboyer et al. (2006)	Comparative Prospective Block Intervention	Liaison nurse	<u>Positive</u> impact on the patient Planning discharge	This aspect was not investigated
Caffin et al. (2007)	Comparative clinical trial	Liaison nurse	<u>Positive</u> effect on <u>relationship, training &amp; Readmission reduction</u>	Positive change to PICU& ward transfers
Eliott et al. (2008)	Before-after clinical trial	Liaison nurse	<u>Positive</u> effect on <u>increased throughput &amp; reduction in inpatient days</u>	This aspect was not investigated
Endacott et al. (2010)	Comparative clinical trial	Liaison nurse	<u>Positive</u> effect on <u>surgical complications Prevention</u>	This aspect was not investigated
Williams et al. (2010)	Before-after clinical trial	Outreach service	<u>Without</u> statistically significant effect	This aspect was not investigated
Chaboyer et al. (2012)	Quality Improvement Study	Redesigned discharge	<ul style="list-style-type: none"> <li>a reduction in the average patient discharge delay time</li> <li><u>no difference in in-hospital mortality after discharge or ICU readmission within 72hr</u></li> </ul>	

# Outcome studies : Korea

- Nurses' experiences of transitional patient from ICU
- The effects of the collaborative transitional care program

Study	Aim	Method	Result
Son et al. (2009)	Identify nurses' experiences in transferring Critically ill patients from the ICU to a ward	Focus group interviews	Seven major categories were identified
Son (2009)	Develop and evaluate the collaborate transitional care program	Quasi-experimental research design	<ul style="list-style-type: none"> <li>• Positive effects on patients and families'</li> <li>• Without statistically significant effect on (ICU) readmission, HD</li> </ul>
Yun (2012)	Develop the transitional nursing program for brain injury patients and family caregivers in the neurological care unit and to verify the effect of the developed program	<ul style="list-style-type: none"> <li>• Methodological design</li> <li>• non-equivalent control group quasi-experimental research design</li> </ul>	<ul style="list-style-type: none"> <li>• Intervention group was showed more healthy patterns of response</li> <li>• Without statistically significant effect on (ICU) readmission, HD</li> </ul>
Kwon et al. (2014)	Explore and identify the role adaptation processes of family caregivers with patients transferred from intensive care unit to general ward	in-depth individual interviews	The core category was 'becoming almost a nurse with hope and fear.'

- To establish a systematic transitional care in Korea, it should begin from the intensive care unit
- As an example, in a Samsung Medical Center study, Advanced Practice Nurses (APN) in the Respiratory Care were directly linked



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**Aims**



# Aims

- Develop the transitional care program
- Evaluate its effects
  - the number of readmissions to ICU
  - the unexpected deaths
  - the number of rapid response team consultancy
  - satisfaction with care



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Design

- Prospective Study
- Randomized control-group pretest-posttest design

	Pre-test	Treatment	Post-tests	
			3days	14days
<b>Experimental group</b>	E1	Transitional care program	E2	E3
<b>Control group</b>	C1		C2	C3

E1, C1 : General characteristics (gender, age),

Clinical characteristics (department, diagnosis category, operative status, Admission type, ICU length of stay, planned ICU admission, Causes for ICU admission, duration of ventilator care, time of ICU discharge

APACHE III Score at ICU discharge , SWIFT Score at ICU discharge ,

Physiologic indicators at ICU discharge(GCS, PaO2 & PaO2/FiO2 ),

length of stay from ventilator weaning to ICU discharge

E2, C2 : Satisfaction with care

E3, C3 : the number of readmissions to ICU, the unexpected deaths, the number of rapid response team consultancy

# Design

- Formal consent from the patient was obtained after a review by the Institutional Review Board of Samsung Medical Center
- 33 patients of the experimental group and 35 patients of the control group in a medical intensive care unit in a tertiary hospital in Seoul

sample size  
 $\alpha=0.05$   
power  $1-\beta=0.80$   
effect size  $f=0.40$   
 $n=40$

Experimental group  
(n=40)

Control group  
(n=40)

- The program centered on follow-up visits by Advanced Practice Nurses in Respiratory Care
- Data were collected from February 2014 to May 2014

Excluded (n=7)  
- Readmission <72hr (n=3)  
- Discharge (n=3)  
- Reject (n=1)

Excluded (n=5)  
- Readmission <72hr (n=2)  
- Discharge (n=2)  
- Reject (n=1)

- Data analyzed by d...  $\chi^2$  test, and Fisher's exact test using the SPSS/WIN statistical program

Completed  
Experimental group (n=33)

Completed  
Control group (n=35)

- Formal consent from the patient was obtained after a review by the Institutional Review Board of Samsung Medical Center
- 33 patients of the experimental group and 35 patients of the control group in a medical intensive care unit in a tertiary hospital in Seoul
- The program centered on follow-up visits by Advanced Practice Nurses in Respiratory Care
- Data were collected from February 2014 to May 2014
- Data analyzed by descriptive statistics, t-test, Mann-Whitey test,  $\chi^2$  test, and Fisher's exact test using the SPSS/Win statistical program



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**Intervention program**

# Intervention program

The configuration of details was done through literature review, needs of patients and family caregivers, opinion surveys of involved medical staff

01  
Program development process

02  
Preliminary program content creation

Intervention and the role of APN can perform during the transition process



The preliminary program was developed by the final program through content validity test of expert group

03  
Preliminary program Validity test

04  
Final program confirmation

After test of clinical Applicability, The final program is decided

# Intervention program

Time	Domain	Content
Pre-transfer (MICU)	Patient care	<ul style="list-style-type: none"> <li>Identifying nursing activities that are required continuously</li> <li>Education and monitoring nursing activities that are required continuously</li> <li>Record for transitional nursing (SWFT score, MEW score)</li> <li>If necessary, provide medical equipment during the transfer process</li> <li>Preparation of medical equipment or personal belongings</li> </ul>
	Ward liaison	<ul style="list-style-type: none"> <li>Communications required for proper preparation of the general ward for patients who require special therapeutic environments or medical equipment</li> </ul>
	Education, support of Patient and family	<ul style="list-style-type: none"> <li>Explanation of the transition decision to the general ward</li> <li>Practical support/education</li> <li>✓ explanation of the differences between the ICU and the general ward, discussion of disease and prognosis, treatment process, future management, precautions, drugs, restricted or allowable activities</li> </ul>

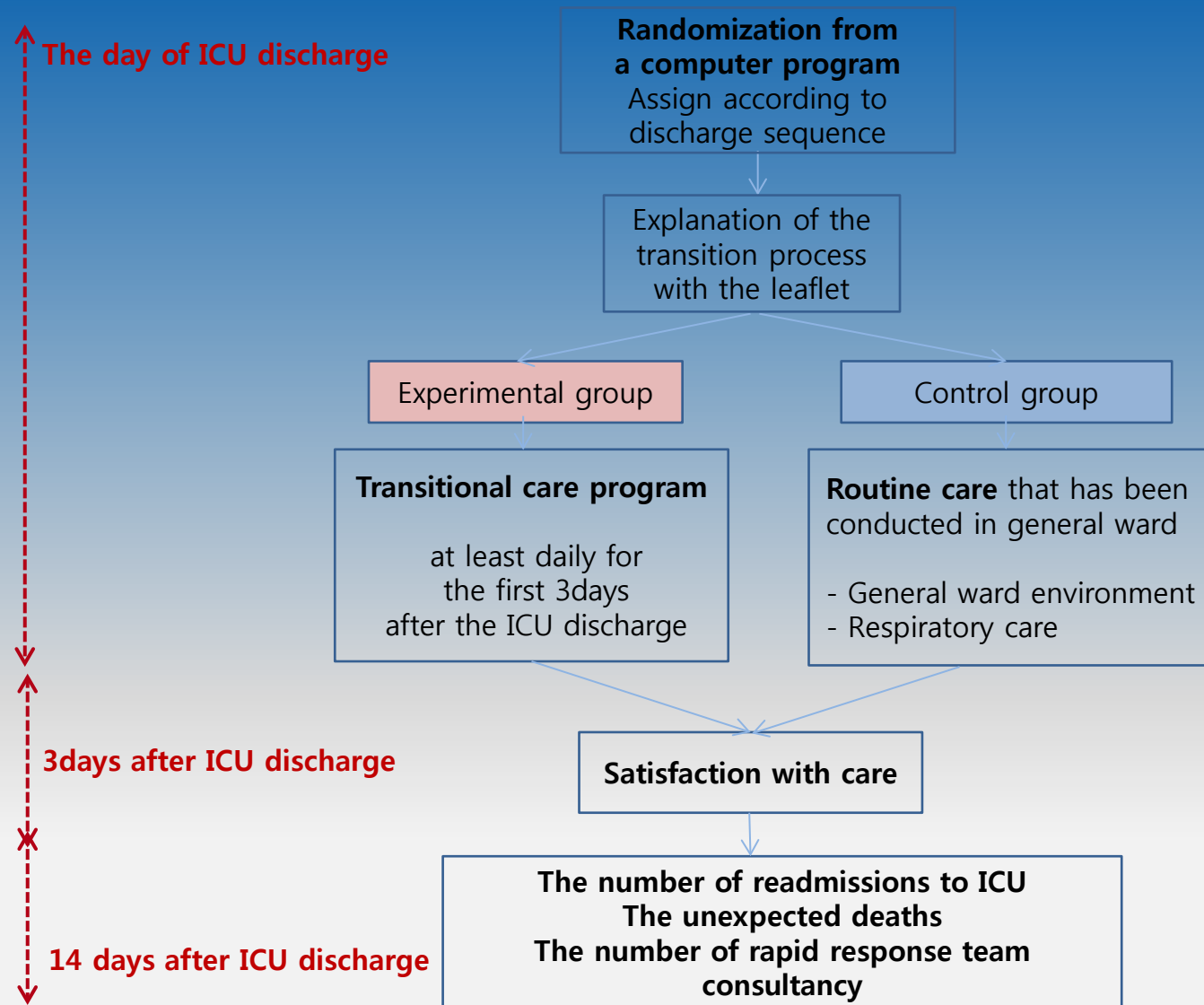
Time	Domain	Content
Pre-transfer (MICU)	Education, support of Patient and family	<ul style="list-style-type: none"> <li>Practical support/education</li> <li>✓ Direct nursing to be done in the ward</li> <li>✓ Education carefully observation (L tube, IV line, skin, mental status, situation notify staff)</li> <li>Explanation of the transition process with Leaflet</li> </ul>
	Consultation coordination	<ul style="list-style-type: none"> <li>Discussions with the doctor about patient's condition</li> <li>Multidisciplinary consultation if necessary</li> </ul>
	Leadership	<ul style="list-style-type: none"> <li>Communication between ICU and ward</li> <li>Preparing ICU and ward staff for transfers</li> </ul>
Transfer (MICU → General ward)	Patient care	<ul style="list-style-type: none"> <li>Assessment of patient's condition during the Transfer process</li> <li>✓ V/S, mental status</li> <li>✓ Drain tube</li> </ul>
	Ward liaison	<ul style="list-style-type: none"> <li>Delivery to the general ward of all the patient's personal belongings and medical equipment</li> </ul>
	Consultation coordination	<ul style="list-style-type: none"> <li>safe transport of patient (if necessary, accompaniment by medical staff)</li> </ul>

Time	Domain	Content
Post-transfer (General ward)	Patient care	<ul style="list-style-type: none"> <li>visit to patient involving clinical assessment and chart review</li> <li>Addressing care management problem</li> <li>Education and monitoring nursing activities that are required continuously</li> <li>Assessment of complex nursing needs</li> <li>Practical assistance on ward</li> </ul>
	Ward liaison	<ul style="list-style-type: none"> <li>Handover: specific anything and provide a information</li> <li>Assessment of patients with major focus</li> <li>✓ Respiratory system care, Postoperative care, Pressure ulcer care</li> <li>Educate and clinical support general ward staff about special treatment environment</li> <li>✓ Home ventilator, High flow nasal cannular</li> <li>Management of emergency situation</li> <li>✓ Home ventilator, difficulty airway, respiratory distress</li> </ul>

Time	Domain	Content
Post-transfer (General ward)	Education, support of Patient and family	<ul style="list-style-type: none"> <li>Emotional support patients and families</li> <li>Practical support/education</li> <li>✓ information about disease and prognosis, treatment process, drugs, precautions, vaccination or limitation of allowable activities</li> <li>Identification and support of nursing information to be provided by family caregivers</li> </ul>
	Consultation coordination	<ul style="list-style-type: none"> <li>Communicating with ward staff and providing support and bedside vaccination is required</li> <li>Multidisciplinary care, liaison</li> <li>Arrange in the ward condition</li> </ul>



# Intervention program





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**Results**

# Baseline characteristics

Characteristics	Total (n=68)	Experimental group (n=33)	Control group (n=35)	t or U or $\chi^2$	p-value
<b>Age, mean(SD), yrs.</b>	61.3(14.3)	60.0(17.1)	62.5(11.2)	-0.704	.484 <sup>a</sup>
<b>Gender, n(%)</b>				0.046	1.000 <sup>b</sup>
<b>Male</b>	38(55.9)	18(54.5)	20(57.1)		
<b>Female</b>	30(44.1)	15(45.5)	15(42.9)		
<b>Department, n(%)</b>				3.418	.203 <sup>b</sup>
<b>Medical</b>	29(42.6)	17(51.5)	12(34.3)		
<b>Surgical</b>	25(36.8)	12(36.4)	13(37.1)		
<b>Critical Care Medicine</b>	14(20.6)	4(12.1)	10(28.6)		
<b>Diagnosis category, n(%)</b>					.924 <sup>c</sup>
<b>Cardiology</b>	3(4.4)	1(3.0)	2(5.7)		
<b>Respiratory</b>	26(38.2)	13(39.4)	13(37.1)		
<b>Gastroenterology</b>	9(13.2)	4(12.1)	5(14.3)		
<b>Nephrology</b>	2(2.9)	1(3.0)	1(2.9)		
<b>Neurology</b>	24(35.3)	11(33.3)	13(37.1)		
<b>Endocrine</b>	2(2.9)	1(3.0)	1(2.9)		
<b>Oncology</b>	2(2.9)	2(6.1)	0(0.0)		

<sup>a</sup>independent t-test, <sup>b</sup> $\chi^2$ -test, <sup>c</sup>Fisher's exact test, <sup>d</sup>Mann-Whitney test

# Baseline characteristics

Characteristics	Total (n=68)	Experimental group (n=33)	Control group (n=35)	t or U or $\chi^2$	p-value
<b>Operative status, n(%)</b>					.327 <sup>c</sup>
No	40(58.8)	20(60.6)	20(57.1)		
Yes	26(38.2)	11(33.3)	15(42.9)		
Procedure	2(2.9)	2(6.1)	0(0.0)		
<b>Planned ICU admission, n(%)</b>				3.024	.094 <sup>b</sup>
Yes	30(44.1)	11(33.3)	19(54.3)		
No	38(55.9)	22(66.7)	16(45.7)		
<b>Admission type, n(%)</b>					.527 <sup>c</sup>
Emergency Room	26(38.2)	15(45.5)	11(31.4)		
General Ward	14(20.6)	5(15.2)	9(25.7)		
Other ICU	3(4.4)	2(6.1)	1(2.9)		
Operating Room	25(36.8)	11(33.3)	14(40.0)		
<b>Causes for ICU admission, n(%)</b>					.827 <sup>c</sup>
Cardiology	5(7.4)	2(6.1)	3(8.6)		
Respiratory	23(33.8)	11(33.3)	12(34.3)		
Neurology	10(14.7)	6(18.2)	4(11.4)		
Gastroenterology	5(7.4)	2(6.1)	3(8.6)		
Post OP care	18(26.5)	7(21.2)	11(31.4)		
Sepsis	6(8.8)	4(12.1)	2(5.7)		
Endocrine and Metabolic	1(1.5)	1(3.0)	0(0.0)		

<sup>a</sup>independent t-test, <sup>b</sup> $\chi^2$ -test, <sup>c</sup>Fisher's exact test, <sup>d</sup>Mann-Whitney test

# Baseline characteristics

Characteristics	Total (n=68)	Experimental group (n=33)	Control group (n=35)	t or U or $\chi^2$	p-value
ICU length of stay, median(range), days	3(1-61)	3(1-61)	3.0(2-33)	534.5	.587 <sup>d</sup>
Duration of ventilator care <sup>1</sup> , median(range), days	4(1-57)	8(1-57)	3(1-14)	42.5	.031 <sup>d*</sup>
length of stay from ventilator weaning to ICU discharge <sup>1</sup> , n(%)				-	.478 <sup>c</sup>
0~1 day	12(46.2)	7(58.3)	5(35.7)		
2~3 day	7(26.9)	2(16.7)	5(35.7)		
≥ 4day	7(26.9)	3(25.0)	4(28.6)		
Time of ICU discharge , n(%)				-	1.000 <sup>c</sup>
Day	59(86.8)	29(87.9)	30(85.7)		
Evening	9(13.2)	4(12.1)	5(14.3)		

<sup>a</sup>independent t-test, <sup>b</sup> $\chi^2$ -test, <sup>c</sup>Fisher's exact test, <sup>d</sup>Mann-Whitney test

# Baseline characteristics

Characteristics	Total (n=68)	Experimental group (n=33)	Control group (n=35)	t or U or $\chi^2$	p-value
<b>Physiologic indicators at ICU discharge</b>					
Last PaCO <sub>2</sub> , mean(SD),mmHg	35.7(6.9)	35.9(6.9)	35.6(6.9)	0.142	.888 <sup>a</sup>
Last PaO <sub>2</sub> /FIO <sub>2</sub> , mean(SD)	346.6(145.9)	353.2(164.0)	340.4(128.8)	0.358	.722 <sup>a</sup>
Discharge GCS, median(range)	15(11-15)	15(11-15)	15(11-15)	551.5	.644 <sup>d</sup>
APACHE III score at ICU discharge, mean(SD)	38.2(19.5)	35.6(18.4)	40.7(20.4)	-1.08	.283 <sup>a</sup>
SWIFT score at ICU discharge, median(range)	12(1-43)	14(1-43)	12(1-28)	540.0	.644 <sup>d</sup>

PaCO<sub>2</sub>=Pressure of arterial carbon dioxide, PaO<sub>2</sub>/FIO<sub>2</sub>=Pressure of arterial oxygen, Fractional inspired oxygen ratio, GCS=Glasgow Coma Scale, APACHE III=Acute Physiology and Chronic Health Evaluation III, SWIFT=Stability and Workload Index for Transfer

<sup>1</sup> a result of Mechanically Ventilated Patients (Experimental group 12, Control group 14)

<sup>a</sup>independent t-test, <sup>b</sup> $\chi^2$ -test, <sup>c</sup>Fisher's exact test, <sup>d</sup>Mann-Whitney test

\*  $p < .05$

# Baseline characteristics

Characteristics	Total (n=68)	Experimental group (n=33)	Control group (n=35)	t or U $\alpha^2$	p-value
ICU length of stay, median(range), days	3(1-61)	3(1-61)	3.0(2-33)	534.5	.587 <sup>d</sup>
Duration of ventilator care <sup>1</sup> , median(range), days	4(1-57)	8(1-57)	3(1-14)	42.5	.031 <sup>d*</sup>
length of stay from ventilator weaning to ICU discharge <sup>1</sup> , n(%)				-	.478 <sup>c</sup>
0~1 day	12(46.2)	7(58.3)	5(35.7)		
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≥ 4day	7(26.9)	3(25.0)	4(28.6)		
Time of ICU discharge , n(%)				-	1.000 <sup>c</sup>
Day	59(86.8)	29(87.9)	30(85.7)		
Evening	9(13.2)	4(12.1)	5(14.3)		

<sup>1</sup> a result of Mechanically Ventilated Patients (**Experimental group 12, Control group 14**)

<sup>a</sup>independent t-test, <sup>b</sup> $\chi^2$ -test, <sup>c</sup>Fisher's exact test, <sup>d</sup>Mann-Whitney test

# Outcomes

Characteristics	Total (n=68)	Experimental group (n=33)	Control group (n=35)	U	p-value
<b>The number of readmissions to ICU, n(%)</b>				-	.191
<b>Yes</b>	5(7.4)	4(12.1)	1(2.9 )		
<b>The unexpected Deaths ,n(%)</b>				-	.493
<b>Yes</b>	2(2.9)	0(0.0)	2(5.7 )		
<b>The number of rapid response Team Consultancy, n(%)</b>				-	.674
<b>Yes</b>	6(8.8 )	2(6.1)	4(11.4 )		
<b>Satisfaction with care, median(range)</b>	8.0 (3.5-10.0)	10.0 (3.5-10.0)	8.0 (5.0-10.0)	366.0	.007*

\*  $p < .05$

Satisfaction rate with transitional care, the experimental group showed significantly higher satisfaction than the control group ( $p=.007$ )



# Activities of the Advanced Practice Nurse

Domain	Category	Contents	Experimental group n(%)	Control group n(%)
<b>Medication Management</b>			12(3.7)	3(5.1)
<b>Respiratory Management</b>			177(54.0)	26(44.1)
	Ventilator Management	Home ventilator	13(4.0)	1(1.7)
		Non-invasive ventilator	12(3.7)	0(0)
		Weaning of Mechanical Ventilator	6(1.8)	1(1.7)
	Chest physiotherapy		56(17.1)	15(25.4)
	Suctioning Management		20(6.1)	6(10.2)
	Prevention of aspiration		7(2.1)	0(0)
	Oxygen Therapy		9(2.7)	1(1.7)
	Nebulizer Therapy		16(5.0)	0(0)
	Medication		5(1.5)	0(0)
Artificial Airway Management		25(7.6)	0(0)	
Pulmonary Rehabilitation		8(2.4)	2(3.4)	
<b>Tube Management</b>			21(6.4)	5(8.5)
<b>Procedure assist</b>			0(0)	0(0.0)
<b>Communication with staff</b>			51(15.5)	10(16.9)
<b>Patient and family support</b>			65(19.8)	15(25.4)
<b>CPR</b>			0(0.0)	0(0.0)
<b>Multidisciplinary consultations</b>			2(0.6)	0(0.0)
<b>Total</b>			328(100)	59(100)



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**Conclusion**

- Several studies have shown beneficial outcomes of transitional care service
  - Our experiment did not show direct benefits in the number of ICU readmissions, unexpected deaths, and rapid response team consultancy
  - Most importantly, the transitional care program is proved to be effective to carry out the continuity of nursing care
-

## Limitation and Suggestions

- True benefits of the program such as the improvement of the transitional care and the provision of educational support for both staff and patients in the general care were not reflected in the quantitative outcomes measured in this study
- To prove the positive results of transitional care, our program should be further applied for a longer clinical practice period and with more number of subjects

*Thank You for attention*

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# Concept of a Variable

- The number of readmission to ICU : the number of readmission after the 3 to 14 days upon the completion of the program
  - The unexpected death : the number of deaths measured after the 3 to 14 days upon the completion of the program
  - The number of rapid response team consultancy : The number of consultancy after the 3 to 14 days upon the completion of the program
  - The satisfaction with the care : the range starting from 1 to 10 (10 being the most satisfied, of course)
-

# Concept of Advanced Practice Nurse

- Similar to its origin, 'Clinical Nurse Practitioner'
- Adopted to reflect the nursing needs of Korea : the license of the critical care unit specialization
- The major roles : acute illness care, airway management, CPR, and

# Activity contents

- The medical staff
  - use special medical equipment
  - encouraged to pay special attention to individual patients
  - Skill training
  - Role of conflict
- The patients and their family
  - Information of immediately contact the medical staff in case of emergency
  - Emotional support
  - Practical assistance



- After the study, we have selected acute patients who required constant care even after they were discharged from ICU
  - under the ventilator, artificial airway, and home ventilator care
  - use special medical equipment

# RRS calling criteria

Domain	Contents	
PULMO	1. Acute respiratory distress	RR $\geq$ 30BPM
	2. Acute hypoxia	SpO2 <85% despite supplementation O2
	3. Acute hypercapnea and acute acidosis	PaCO2 > 50mmHg and pH < 7.3
	4. Upper airway obstruction	Stridor or accessory muscle use
CARDIO	5. Unexplained hypotension	SBP<85mmHg
	6. Acute chest pain	
	7. Bradycardia or tachycardia	HR>130BPM
	8. Arrhythmia with symptom	
NEURO	9. Sudden mental change or unexplained agitation	
	10. Seizure	
Besides	11. Bedside nurse concern about overall deterioration	

## Limitation

- Each hospital has its own characteristics
  - protocols and environmental factors to take into consideration  
an oversight to say all hospitals can have the same types of transitional care
  - What is important here is to exactly understand the role and effect of transitional care and apply it accordingly.
  - So far this is a more voluntary and clinical adaptation period.
  - It is hard to measure the positive impact of transitional care in quantitative terms. But we believe this should be still applied as effective preventative measures for the safety of critical patients.
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*Thank You for attention*

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