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(Sensory deprivation)

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가 (Roy, 1970; Kneisi & (Finger & Stein, 1982).  
Ames, 1986). ， ， ， 가

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(Scherer, 1986; Park, 1988).

(Karter, 1989;

Mackay, 1992; Sosnoski & Ustik, 1994; Mitchell,  
Bradley, Welch, & Britton, 1990; Cope, 1995).

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(Kater, 1989; Sosnowski & Usik, 1994).

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(Kater, 1989; Mackay,  
1992; Wood, Winkowski, Miller, Tierney, &  
Goldman, 1992)

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2001 6 12

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Yim (1992)

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Song (1997)

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( CT

, MRI , )

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(Wood, 1991)

Glasgow coma scale (Teasdale & Jennett, 1974)

가 3-10 ( , , )

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가 가 가

(Kater, 1989; Sosnowski & Ustik, 1994)

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4)

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(Wood, 1991).

Glasgow coma scale (Teasdale & Jennett, 1974)

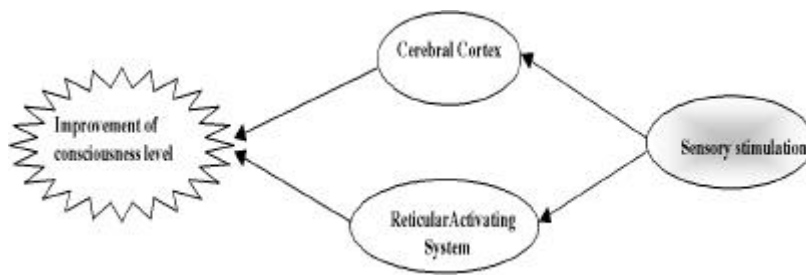
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<Figure 1>



<Figure 1> The influence of sensory stimulation on Consciousness level

가 , 5)  
(RAS: 가  
Reticular Activating System) 8 가  
(Deyoung & Grass, 1987)  
가 3.  
5. 가 4  
(baseline data) , 4  
1 (5 / ).  
4 ( )  
가 .  
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1. 2가 4  
8 가  
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<Table 1>. Woods et al.  
(1992)

2. (biased measurement)  
가  
(Sub-ICU) 가  
1) 3  
, 2) Glasgow coma scale 3 ~ 10  
, 3) 가  
18 , 4) 가 가

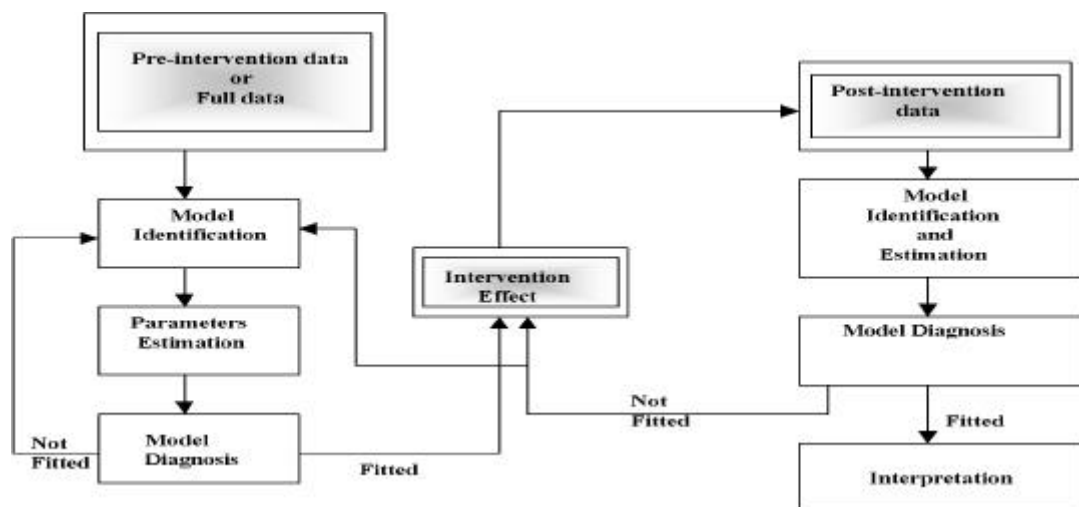


&lt;Table 2&gt; Intervention Protocol

Sensation/ Motor	Types of stimulation	Stimulation methods	duration and frequencies
visual	Pen light, Photos of Family and friend, Family face, Colorful cards (select one or two)	On: 1 second, Off: 10 sec (repeat 5 times)	two times / day
auditory	Verbal orientation, music, bell sound, clap sound, Tuning fork (select two or three)	Music : provided for 15 min Else : right ear and left ear with 3 times per each	two times/day
olfactory	vinegar, ammonia, fragrant, perfume, orange, lemon juice (select two or more)	provided for 5 second--repeat two times	two times/day
taste	oral care, lemon juice, tabasco source, sweets, salty taste (select two or more)	slightly touch on tongue with cotton stick	two times/day
touch tactile	softly touch hands, massage with lotion, touch with feather, softly rob with sandpaper (select two or more)	1 cycle : right arm, left arm, right leg, left leg, respectively -repeat 3 times	two times/day
temper pain	ice pack / hot pack providing pressure on leg or arm		
Motor	position change, ROM exercise	ROM exercise for arms and legs -repeat 3 times	two times/day

\* temper : temperature

Nt at (white noise, random shock,  
 random error : 가  
 (Metzger & Schultz,  
 1982; Holm, 1983; Jirovec, 1986; Jenson,  
 1990)  
 random error)  
 Nt (white  
 noise or random error)  
 10  
 가 f(It)  
 <f(It)>  
 가 , ,  
 가 , ,  
 Nt  
 가 가  
 가 Nt  
 (Jung, 1994; Yaffey &  
 Jung, 1994; Nam, 1995). McGee, 2000, pp. 285) 가  
 < 2>  
 "Yt = f(It) + Nt"  
 Nt 가 , ,



<Figure 2> Model for Interrupted Time series Analysis

가 가

<Table 3>

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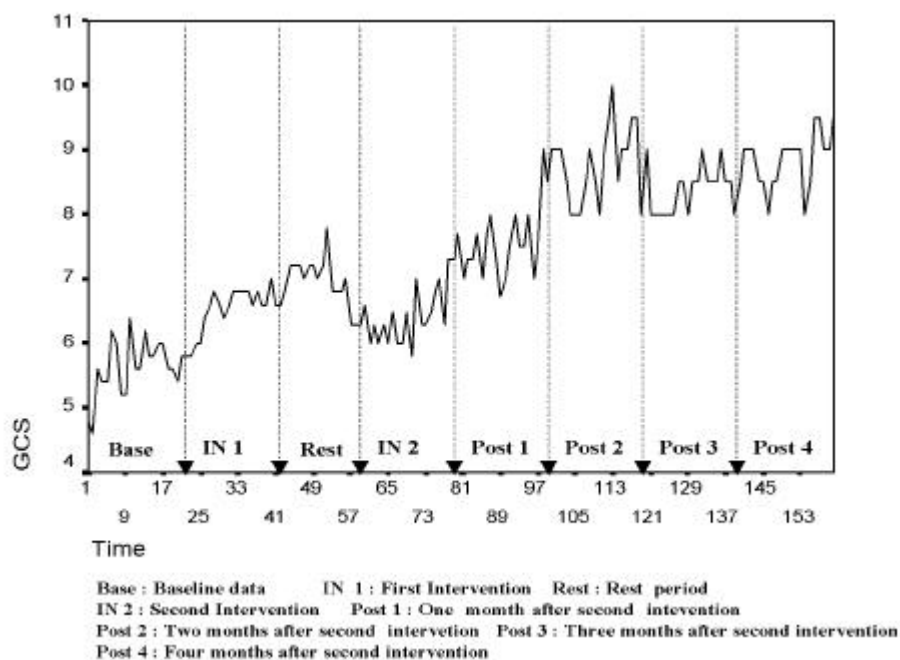
. 8

<Table 3> The characteristics of the participants of the study

PA	Age	gender	Diagnosis	Surgery	ADM GCS	ST GCS
A	39	M	Aneyrism rupture/SAH	Aneyrism Clipping/ EVD, VP shunt	5	7
B	60	M	ICH (basal ganglia)	-	5	5
C	50	M	Traumatic SDH/EDH/SAH	V-P shunt, Hematoma removal	10	5
D	48	M	Pontine hemorrhage	EVD	5	3
E	54	M	ICH (thalamus)/IVH	EVD	-	5

\* PA : patient Surgery : types of surgery ADM GCS : the score of GCS at admission

ST GCS : the score of GCS at the time of participating in the study



<Figure 3> Changes of GCS scores with pre-intervention and post-intervention

가 (white noise random shock) (lag 6 : Chi-square = 10.8,  $p = .10$ ; lag 12 : Chi-square = 12.02,  $p = .44$ ).

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1) 1 ( 1) 가

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(model identification)

ARIMA (Auto Regressive Intergrated Moving Average)  $p, d, q$

<Table 4>, ARIMA (0, 1, 1) X (0, 1,

1)20 (MA1,1= .67,

$T = 2.51$ ; MA2,1= .61,  $T = 5.65$ ) <

$T = 1.64$  ( )

>.

<Table 4>.

<Table 5>

0.05

가

<Table 4> Identification and Estimation of Nt model

Conditional Least Square Estimation				
Parameter	Estimation	Std Error	T Ratio	Lag
MA1,1	.67	.11	5.65	0
MA2,1	.68	.19	3.51	20

&lt;Table 5&gt; Diagnosis for Nt model

Autocorrelation Check of Residuals								
To lag	Chi square	Prob	Autocorrelations					
6	6.11	.30	.11	-.06	-.04	-.07	-.02	-.09
12	7.09	.79	-.11	.05	.11	.00	-.03	.00

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2 가 1

"Yt = 1Yt-10 + 0

It(1-10)"

<Table 6> 2 <Table 4> <Table 5>

(Num 1, 2

1 = .11, T=2.82), 1 2

(Den 1, 1 = .71, T=21.06) 가 <figure 3> "

1 2

가 2

(Num 2, 1 = 1.23, t = 1.73, 2 가

). (lag 가 가 가

6 : chi-square = 4.18, p = .52; lag 12 :

chi-square = .83, p = .14 ....) "Yt = 0 It-10/1- 1L"

<Table 7>. 1 "

가 2 <Table 8>, 0

(Num 1 = .12, T = 1.14)가 2

가 (Num 1,

(trend) 가 가 1 1 = .56, T = 2.21) 1

(Den 1, 1 = .23, T = 2.02) 가

&lt;Table 6&gt; Identification and Estimation of the First Interrupted Intervention model

Conditional Least Square Estimation				
Parameter	Estimation	Std Error	T Ratio	Lag
MA1,1	.67	.11	2.51	0
MA2,1	.68	.19	3.51	20
Num 1	.015	.04	.38	0
Num 1, 1	.11	.04	2.82	10
Num 2, 1	1.23	.71	1.73	10
Den 1, 1	.73	.03	21.06	1

&lt;Table 7&gt; Diagnosis of the First Interrupted Intervention model

Autocorrelation Check of Residuals								
To lag	Chi square	Prob	Autocorrelations					
6	4.18	.52	.07	.03	.00	.07	.22	-.02
12	6.62	.83	.14	.00	-.06	-.02	.05	.09
18	8.58	.95	-.01	.03	-.02	-.00	.11	-.10
24	16.75	.82	.19	-.18	-.01	-.04	-.04	.12



&lt;Table 8&gt; Identification and Estimation of the Second Interrupted Intervention model

Conditional Least Square Estimation				
Parameter	Estimation	Std Error	T Ratio	Lag
MA1,1	.40	.13	3.11	1
MA2,1	.68	.20	3.51	20
Num1	.12	.11	1.14	0
Num1, 1	.56	.26	2.21	10
Den1, 1	.23	.14	2.02	2

&lt;Table 9&gt; Diagnosis of the Second Interrupted Intervention model

Autocorrelation Check of Residuals								
To lag	Chi square	Prob	Autocorrelations					
6	3.64	.46	.06	-.18	-.00	.14	.03	.01
12	11.87	.29	.14	.12	-.17	-.21	.06	.03
18	13.82	.61	-.07	-.08	.02	.01	-.01	-.11
24	17.46	.74	.17	.04	.04	-.06	.07	.03

&lt;Table 8&gt;. ”

(Gradual onset and Permanent

duration)“

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&lt;Table 9&gt;.

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&lt;Figure 3&gt;

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- Abstract -

# The Analysis of the Effects of Intervetion Program of Sensory Stimulation for Comatous Patients on Their Consciousness Status\*

Oh, Hyun-Soo \*\*

Purpose: This study was to examine the rate of recovery from the consciousness

impairment from two sessions of comprehensive consciousness stimulation program. Which was developed for this study, was higher than the one which was obtained naturally with only conventional care. Method: The subjects were selected among the patients who were admitted in the Intensive Care Unit or in the Sub-Intensive Care Unit in one of the university hospital, located in Inchon. For the treatment of the deterioration of his/her consciousness level resulting from neurological causes. Results: The effect of the first intervention on consciousness state began to appear two weeks the intervention initiation and to disappear two weeks after the end of the intervention. The significant effect of the second session of the consciousness stimulation program also began to appear two weeks the second intervention initiation and persisted until 4 months after intervention was terminated. Conclusion: It appeared that the first intervention effect had gradual onset and gradual decay, while the second intervention effect had gradual onset and permanent duration.

Key words : Coma stimulation program,  
Consciousness state, Time series  
analysis

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