

TATALAKSANA REHABILITASI MEDIK TRAUMA MEDULA SPINALIS

Ika Rosdiana

Pengantar

- **Dari semua jenis trauma, NEUROTRAUMA, yaitu trauma yang mengenai Sistem saraf Pusat, adalah trauma yang paling berat akibatnya terhadap kehidupan manusia**
- **Dari kejadian trauma otak dan medulla spinalis membuktikan kerugian yang amat besar terhadap penderita, keluarga maupun masyarakat**

WHO. 1995

Proses kecacatan

- Tidak statis
- Timbulnya komplikasi-komplikasi dapat dengan mudah memperburuk keadaan

Epidemiologi (USA)

- **Insidensi : 29.4 – 50 / 1.000.000 orang**
- **Terutama mengenai orang yang muda, aktif dan terpelajar**
- **Usia : 50% menimpa usia < 30 tahun**
- **Laki-laki : perempuan 2.4 – 4 : 1**

Penyebab

- **Kecelakaan lalu-lintas 45.4%**
- **Jatuh dari ketinggian 16.8%**
- **Cedera Olahraga 16.3%**

EPIDEMIOLOGI (Sby), 1999 - 2001

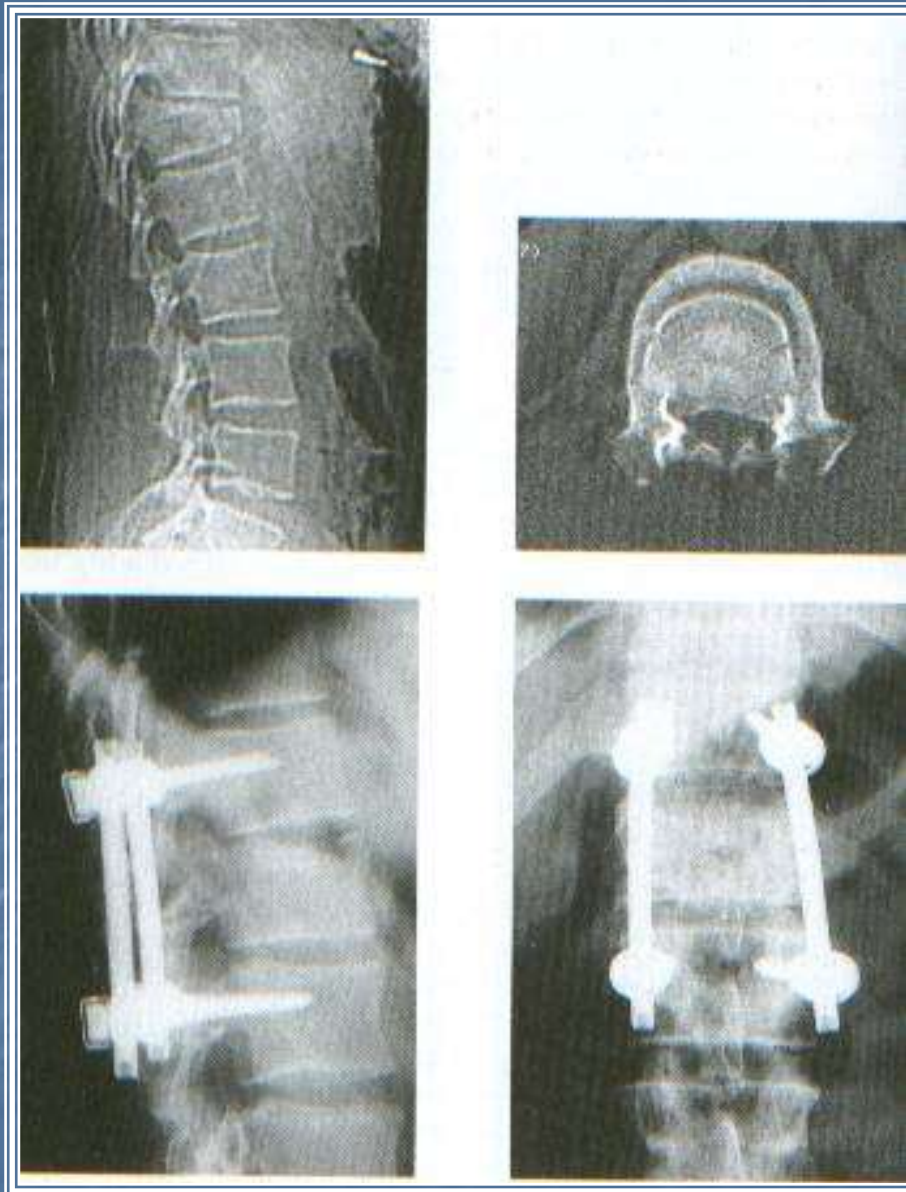
- **Jumlah penderita** 425
- **Usia (rata-rata)** 35 tahun
- **Laki-laki : Perempuan** 2.4 – 4.4 : 1
- **Letak cedera** : Cerv 16.9% Th. 26.7% L. 56.4%
- **Penyebab** : Kecelakaan LL 86% , Jatuh 14%
- **Frankel / ASIA** : A 24%
B 9.5%
C 10.3%
D 11.1%
E 45.2%

Komplikasi cedera MS

- 1. Kandung Kencing Neurogenik → Infeksi Sal. Kencing dan Gangguan fungsi ginjal**
- 2. Infeksi saluran pernapasan**
- 3. DVT (Deep Venous Thrombosis)**
- 4. Neurogenic Bowel**
- 5. Luka tekanan / Luka tempat tidur / luka dekubitus**
- 6. Kontraktur dan deformitas sendi**
- 7. Disfungsi seksual dan Infertilitas**
- 8. Nyeri kronis**
- 9. Depresi**

MANAGEMENT PADA FASE AKUT :

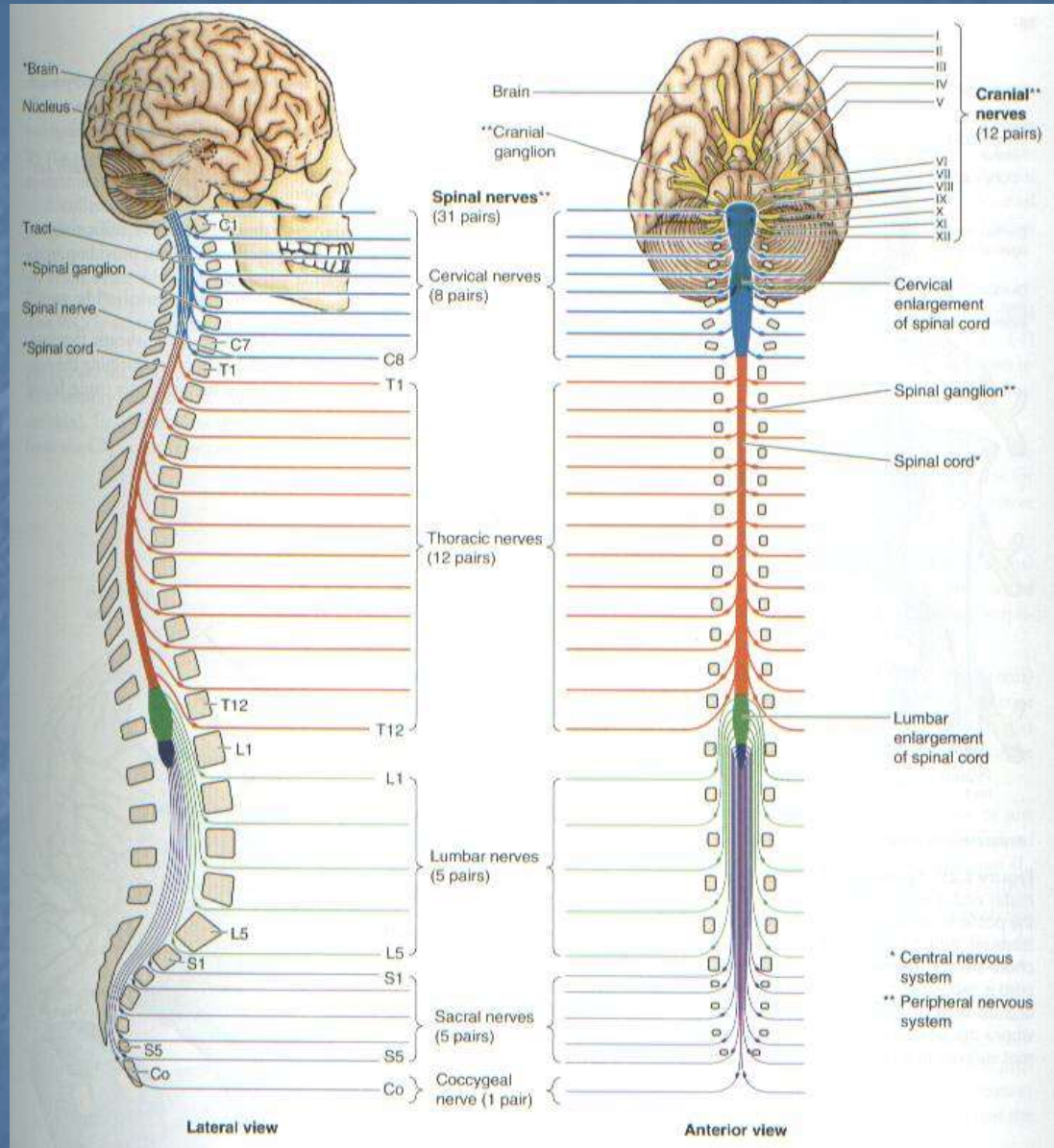
- Pertahankan penderita tetap hidup
- Tegakkan Diagnosa dengan tepat
- Mencegah Komplikasi
- Tentukan apakah diperlukan tindakan stabilisasi tulang belakang



Cedera MS diklasifikasikan berdasarkan Standar Internasional untuk Klasifikasi Neurologik dan Fungsional



**FUNGSI SENSORIK
FUNGSI MOTORIK**



STANDARD NEUROLOGICAL CLASSIFICATION OF SPINAL CORD INJURY

MOTOR

KEY MUSCLES

	R	L
C2		
C3		
C4		
C5		
C6		
C7		
C8		
T1		
T2		
T3		
T4		
T5		
T6		
T7		
T8		
T9		
T10		
T11		
T12		
L1		
L2		
L3		
L4		
L5		
S1		
S2		
S3		
S4-5		

- Elbow flexors
- Wrist extensors
- Elbow extensors
- Finger flexors (distal phalanx of middle finger)
- Finger abductors (5th finger)

- 0 = not assessable
- 1 = palpable or visible contraction
- 2 = active movement, gravity eliminated
- 3 = active movement, against gravity
- 4 = active movement, against some resistance
- 5 = active movement, against full resistance
- NT = not testable

- Hip flexors
- Knee extensors
- Ankle dorsiflexors
- Long toe extensors
- Ankle plantar flexors

Voluntary anal contraction (Yes/No)

TOTALS + = MOTOR SCORE
(MAXIMUM) (50) (50) (100)

LIGHT TOUCH PIN PRICK

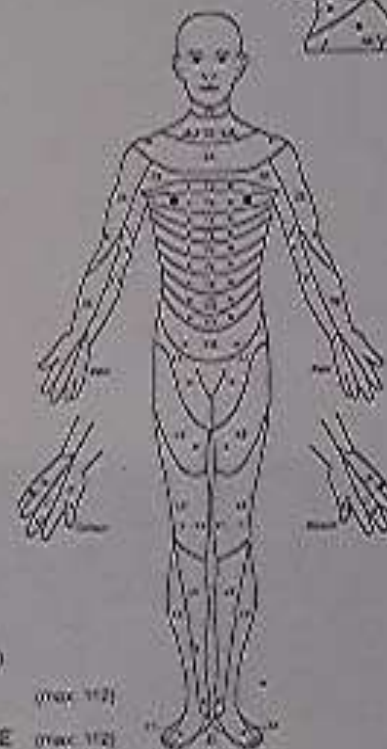
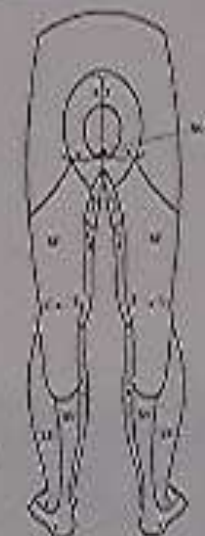
	R	L	R	L
C2				
C3				
C4				
C5				
C6				
C7				
C8				
T1				
T2				
T3				
T4				
T5				
T6				
T7				
T8				
T9				
T10				
T11				
T12				
L1				
L2				
L3				
L4				
L5				
S1				
S2				
S3				
S4-5				

- 0 = absent
- 1 = altered
- 2 = normal
- NT = not testable

TOTALS = PIN PRICK SCORE (max. 112)
 = LIGHT TOUCH SCORE (max. 112)
 (MAXIMUM) (55) (55) (55) (56)

SENSORY

KEY SENSORY POINTS



NEUROLOGICAL LEVEL

The most caudal segment with normal function

SENSORY MOTOR

	R	L
SENSORY	<input type="checkbox"/>	<input type="checkbox"/>
MOTOR	<input type="checkbox"/>	<input type="checkbox"/>

COMPLETE OR INCOMPLETE?

Incomplete = Any sensory or motor function at S4-5

ASIA IMPAIRMENT SCALE

ZONE OF PARTIAL PRESERVATION

Caudal extent of partially involved segments

SENSORY MOTOR

	R	L
SENSORY	<input type="checkbox"/>	<input type="checkbox"/>
MOTOR	<input type="checkbox"/>	<input type="checkbox"/>

This form may be copied freely but should not be altered without permission from the American Spinal Injury Association.

SCALE FOR MOTOR TESTING :

0 : Total paralysis

1 : Trace

2 : Poor

3 : Fair

4 : Good

5 : Normal

Scale for Sensory testing : (*Pin prick and Light touch*)

0 : Absent

1 : Impaired

2 : Normal

International Standards for Neurological and Functional Classification of SCI (ASIA):

10 MYOTOMES

28 DERMATOMES

TERMINOLOGIES :

1. TETRAPLEGIA

injury to SC in the cervical region

2. PARAPLEGIA :

injury in the Thoracic, Lumbar or Sacral segments

IMPAIRMENT SCALE :

- A : Complete.** No motor or sensory function is preserved in the sacral segments S4-S5
- B : Incomplete.** Sensory but not motor function is preserved below the neurological level →S4-S5
- C : Incomplete.** Motor function is preserved below the neurological level. Majority of key muscles below the level : < 3
- D : Incomplete.** \sim C , majority of key muscles > 3
- E : Normal.** Motor and sensory function is normal





2 PEMBUNUH UTAMA Cedera MS :

1. KANDUNG KENCING

2. SAL. PERNAPASAN

INFEKSI PADA PEMAKAIAN KATETER MENETAP

- **Infeksi : Bakteriuria + leucocyturia**
- **Infeksi tidak terhindarkan !**
5% / hari
Maksimum steril hanya sampai
2 minggu

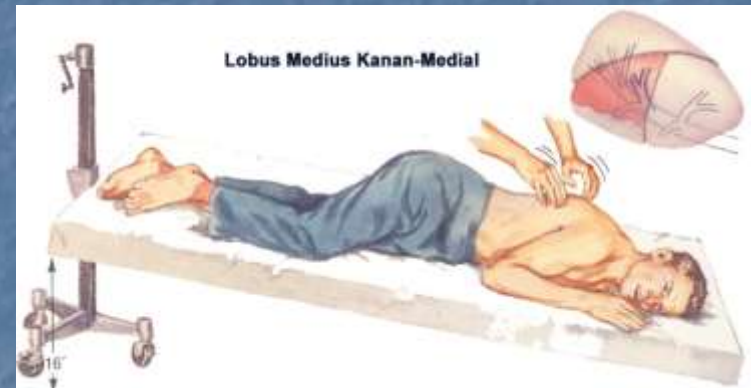
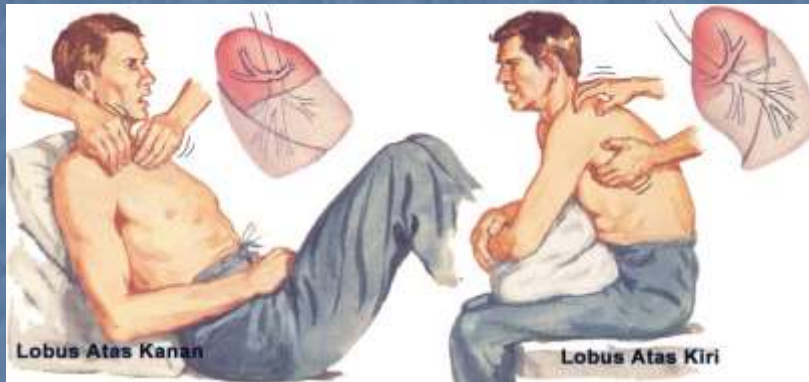




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Prevention of Pneumonia

- Chest therapy → to clear airway secretions
- Breathing exc. , Assisted cough technique, ventilatory muscle training
- Positioning

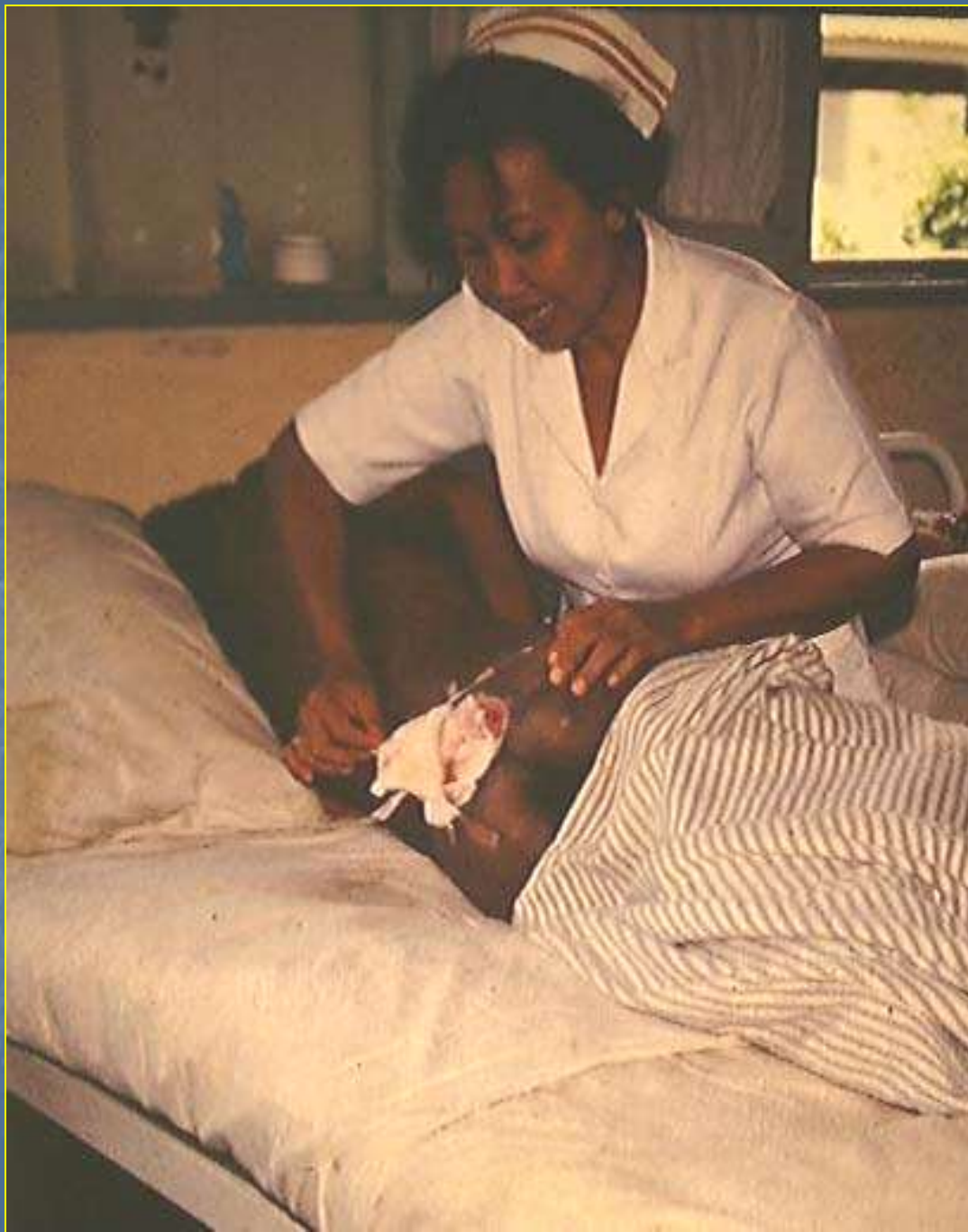


OTOT-OTOT PERNAPASAN :

1. DIAFRAGMA C3 – C5
2. Otot-otot asesori
 - M. Sternocleidomastoid C2 – C4
 - M. Trapezius C2 – C4
 - Mm. Rhomboideus C4 – C5
 - Mm. Scaleni C4 – C7
3. Intercostalis T1 – T12
4. Otot abdomen T8 – T12

KOMPLIKASI SAL. NAPAS :

- Inspirasi tidak adekuat → Oksigen uptake turun
- Batuk kurang kuat → penumpukan mukus → sumbatan mukus
- Kongesti saluran napas
- Infeksi







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PRESSURE ULCERS :

OTHER INTERNAL FACTORS

- Anemia
- Fever
- Malnutrition
- Aging
- Psychology



PRESSURE ULCERS : PREVENTION STRATEGIES

INTERNAL FACTORS

ASSESSMENT

- Paralysis & sensory Loss
- Fever
- Anemia
- Malnutrition

PREVENTION

- Frequent pressure relief
- Regular skin inspection
- Maintain hematocrite
- Balanced diet ~ iron suplemen
- Well balanced diet → healthy body weight & nutritional level

EXTERNAL FACTORS

ASSESSMENT

- Pressure
- Shear
- Positioning
- Moisture/body hygiene

PREVENTION

- Relief every 15 – 30 min
- Turning every 2 hours
- Cushions / matras
- Clothing / linen wrinkle free
- ↓ sliding & friction
- Protect from trauma
- Correct deformities
- Bony Prominens
- Maintain Clean Dry Skin





N.A.M.A.
DUGMOZA
TGL. NRS. PND



NAMA
DIAGNOSA
TGL MRS/PIND.

NAMA
DIAGNOSA
TGL MRS/PIND.





NAMA
DIAGNOSA

AMBULASI PADA CSTB KOMPLIT :



Kursi roda

T 12 Paraplegia

Tanpa kursi roda













thanks

Bagaimana menggunakan AIS

1. Tentukan level sensorik :
Segmen paling kaudal dari MS dgn fungsi sensorik normal pd kedua sisi
2. Tentukan level motorik :
keypoint muscle paling caudal yg mempunyai MMT minimal 3 dan di bagian rostral harus 5
3. Tentukan neurologic level:
Segemen terbawah dimana sensorik dan motorik normal dari kedua sisi
4. Tentukan komplit atau inkomplit dgn voluntary anal contraction dan sensasi anal
5. Tentukan ASIA A-E

IMPAIRMENT SCALE :

- A : Complete.** No motor or sensory function is preserved in the sacral segments S4-S5
- B : Incomplete.** Sensory but not motor function is preserved below the neurological level →S4-S5
- C : Incomplete.** Motor function is preserved below the neurological level. Majority of key muscles below the level : < 3
- D : Incomplete.** \sim C , majority of key muscles > 3
- E : Normal.** Motor and sensory function is normal

Soal : menentukan level

	Motor		Sensory	
	R	L	R	L
L1	5	5	2	2
L2	3	3	1	1
L3	0	0	0	0
L4	0	0	0	0
L5	0	0	0	0
Anal vol	N			
Anal sens	N			

Bila anal vol dan anal sensasi + atau Y maka:.....