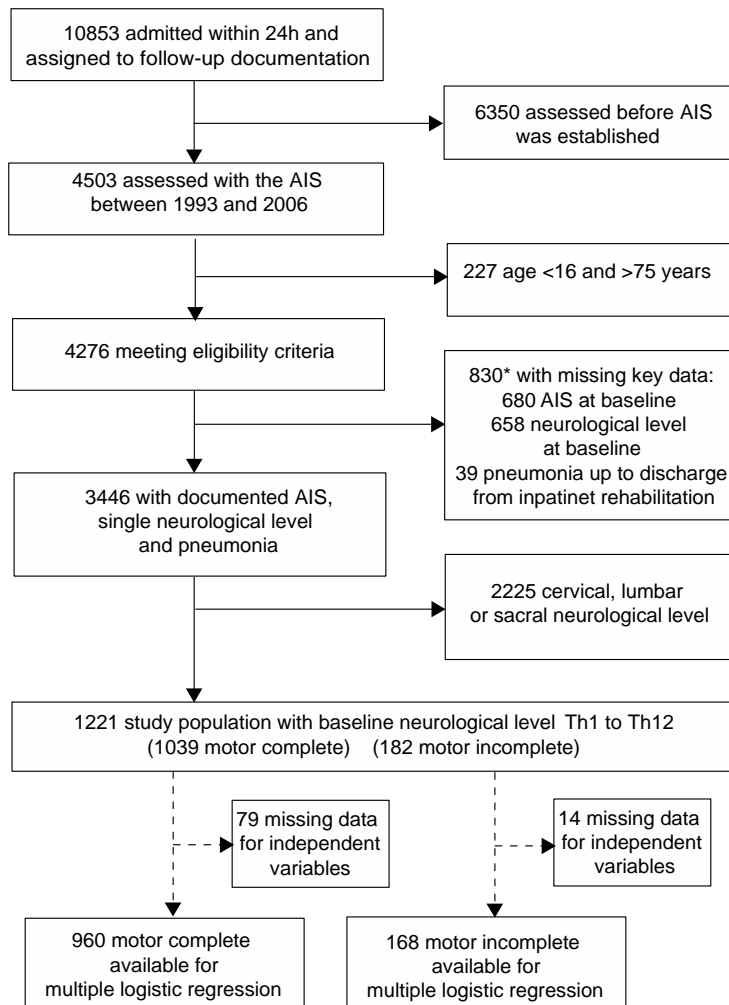## Supplementary Materials:
Supplemental Figure 1: Patient enrolment chart

Supplemental Figure 1. Patients included into the NSCID within one day after SCI were assigned to follow up documentation. Datasets of patients enrolled until 2006 could be included, because pneumonia was documented in the NSCID until 2006. The data for statistical analysis were selected in a stepwise manner with regard to the quality of the particular measurement tools, possible confounding factors and the availability of key baseline parameters. Consequently, (i) datasets assessed using the outdated Frankel scale before it was replaced by the AIS in 1993, (ii) pediatric and elderly patients, (iii) datasets with missing baseline data on the neurological level and the AIS and patients with missing documentation on pneumonia during hospitalization were excluded. The AIS is also encoded as missing, if concomitant injury such as TBI interferes with the neurological examination. Furthermore, (iv) patients with cervical and lumbosacral SCI were not included into the study population because relevant differences is residual respiratory function would apply. Abbreviations: AIS = ASIA impairment scale, NSCID = National Spinal Cord Injury Database, SCI = spinal cord injury. *Total numbers differ from subgroup numbers because some items apply several times.

Supplemental Table 1: Baseline characteristics of the excluded datasets compared with the eligible datasets (n=10,853)

Baseline characteristics	Eligible datasets	Non-eligible datasets
Age: Years mean (95%CI), n	36.4 (36.0-36.9), 4276	32.7 (32.3-33.1), 6583
Gender: Male n / total n [%(95%CI)]	3461 / 4276 [80.9 (79.7-82.1)]	5377 / 6583 [81.7 (80.8-82.6)]
Race: Caucasian n / total n [%(95%CI)]	2696 / 4060 [66.4 (64.9-67.9)]	4196 / 5948 [70.5 (69.3-71.7)]
Neurological level T1-T4 n / total n [%(95%CI)]	370 / 3681 [10.2 (9.2-11.2)]	531 / 6461 [8.2 (7.5-8.7)]
Neurological level T5-T8 n / total n [%(95%CI)]	317 / 3681 [8.8 (7.9-9.7)]	684 / 6461 [10.6 (9.8-11.4)]
Neurological level T9-T12 n / total n [%(95%CI)]	599 / 3681 [16.6 (15.4-17.8)]	1067 / 6461 [16.5 (15.6-17.4)]
Neurological level other n / total n [%(95%CI)]	2332 / 3681 [64.5(63.0-66.0)]	4179 / 6461 [64.7 (63.3-65.9)]

Supplemental Table 1: To address patient selection as a potential source of bias eligible datasets (n=4276) were compared with datasets (n=6583) excluded because they were assessed with the outdated Frankel scale and because of patient's age < 16 and > 75 years. The groups are comparable in terms of gender and neurological level. The groups are slightly different in age and race. This can be explained by changing epidemiology of SCI over time because the Frankel scale was used before 1993 and replaced by the AIS from 1993 onwards. Differences in total numbers within the groups are due to missing values. Abbreviations: AIS = ASIA impairment scale, CI= Confidence interval.

Supplemental Table 2: Missing key data analysis in the population meeting eligibility criteria (n=4,276)

Sociodemographic data	with missing key data	w/o missing key data	p-value
Age: mean ± SD	36,6 ± 15,5	36,4 ± 15,1	0.78
Gender: Male n / total n (%)	667 / 830 (80.4)	2794 / 3446 (81.1)	0.64
Race: Caucasian n / total n (%)	551 / 800 (68.9)	2145 / 3260 (65.8)	0.10

Supplemental Table 2: The baseline characteristics of patients not included into the analysis because of missing key data, i.e. baseline neurological data and pneumonia during hospitalization (n=830) were compared to patients without missing key data (n=3446). No baseline differences could be observed between the groups. Differences in total numbers within the groups are due to missing values.

Supplementary Table 3: Baseline characteristics and clinical data

Baseline characteristics and clinical data	With SCI-AP	w/o SCI-AP	p-value
Age: mean ± SD (n)	34,0 ± 14,4 (362)	32,0 ± 12,7 (859)	0.02
Gender: Male n / total n (%)	292 / 362 (80.7)	707 / 859 (82.3)	0.50
Race: Caucasian n / total n (%)	226 / 351 (64.4)	496 / 788 (62.9)	0.64
AIS A n / total n (%)	290 / 362 (80.1)	588 / 859 (68.5)	<0.001
AIS B n / total n (%)	36 / 362 (9.9)	125 / 859 (14.6)	
AIS C n / total n (%)	29 / 362 (8.0)	89 / 859 (10.4)	
AIS D n / total n (%)	7 / 362 (1.9)	57 / 859 (6.6)	
Neurological level T1-T4 n / total n (%)	137 / 362 (37.8)	221 / 859 (25.7)	<0.001
Neurological level T5-T8 n / total n (%)	96 / 362 (26.5)	209 / 859 (24.3)	
Neurological level T9-T12 n / total n (%)	129 / 362 (35.6)	429 / 859 (49.9)	
Penetrating injury n / total n (%)	112 / 261 (31.0)	264 / 858 (30.8)	0.93
Spinal surgery n / total n (%)	221 / 362 (61.0)	524 / 859 (61.0)	0.99
Pulmonary embolism n / total n (%)	15 / 361 (4.2)	20 / 858 (2.3)	0.08
Mechanical ventilation n / total n (%)	127 / 362 (35.1)	84 / 852 (9.9)	<0.001

Supplementary Table 3: Distribution of baseline characteristics and clinical characteristics as occurring during follow up. For statistical comparison between the groups (with SCI-associated pneumonia (SCI-AP) or w/o SCI-AP) the Student's t-test test was used for age, the Chi-square test was applied for all other variables. Differences in patient numbers within the groups result from missing data for the respective variables. Abbreviations: AIS = ASIA impairment scale; SD = standard deviation.

Supplemenaty Table 4: Spinal cord injury associated pneumonia (SCI-AP) is lesion severity and lesion level dependent after human SCI.

Variable	Univariate analysis		Multiple analysis	
	OR (95% CI)	p-value	OR (95% CI)	p-value
Age (per 15 years increase)	1.16 (0.99-1.36)	0.06	1.10 (0.92-1.31)	0.32
Gender (Male = 1; Female = 2)	1.15 (0.83-1.60)	0.41	0.98 (0.68-1.41)	0.90
Race (Caucasian = 0; Others = 1)	0.89 (0.68-1.18)	0.42	0.81 (0.57-1.15)	0.23
Neurological level (T9-T12 = 1; T5-T8 = 2 T1-T4 = 3)	1.51 (1.29-1.76)	<0.001	1.35 (1.14-1.60)	<0.001
AIS (B = 1; A = 2)	1.71 (1.15-2.55)	0.008	1.58 (1.03-2.42)	0.04
Penetrating injury (No = 0; Yes =1)	0.92 (0.70-1.22)	0.58	1.05 (0.64-1.74)	0.84
Spinal surgery (No = 0; Yes =1)	1.01 (0.78-1.33)	0.92	0.91 (0.59-1.40)	0.66
Pulmonary embolism (No = 0; Yes =1)	1.74 (0.85-3.53)	0.13	1.79 (0.84-3.81)	0.13
Mechanical ventilation (No = 0; Yes =1)	4.33 (3.12-5.99)	<0.001	3.87 (2.75-5.45)	<0.001

Supplementary Table 4: Univariate and multiple logistic regression analysis (n=960) in motor complete patients (AIS A and B) using occurrence of SCI-associated pneumonia (SCI-AP) as dependent variable. Due to juxtaposed neuroanatomical localization motor-complete SCI-patients display an excellent at-level correspondence between somatic and complete sympathetic deafferentation (*Karlsson, 1999*). SCI-AP is lesion severity and lesion level dependent emphasizing a 'neurogenic' association. The coding of the variable categories is indicated in the table. (Multivariate model: Nagelkerkes R^2=0.14, Hosmer-Lemeshow-Test p=0,46). Tests for interactions between neurological level and AIS as well as between the neurological level and mechanical ventilation were not significant (p = 0.77, p=0.85). Lesion level determines the fate patients to develop pneumonia independent from mechanical ventilation. Abbreviations: AIS = ASIA impairment scale; CI= Confidence interval; OR = Odds ratio.

Supplemental Table 5: Logistic regression analysis in motor incomplete patients (AIS C and D) using occurrence of SCI-associated pneumonia (Pn) as dependent variable

Variable	Univariate analysis		Multiple analysis	
	OR (95% CI)	p-value	OR (95% CI)	p-value
Age (per 15 years increase)	1.52 (1.05-2.20)	0.03	1.76 (1.07-2.90)	0.03
Gender (Male = 1; Female = 2)	0.67 (0.22-2.07)	0.49	0.26 (0.05-1.38)	0.11
Race (Caucasian = 0; Others = 1)	1.07 (0.47-2.43)	0.88	0.62 (0.17-2.24)	0.46
Neurological level (T9-T12 = 1; T5-T8 = 2 T1-T4 = 3)	0.86 (0.54-1.35)	0.51	0.82 (0.47-1.43)	0.48
AIS (D = 1; C = 2)	2.65 (1.09-6.46)	0.03	2.47 (0.89-6.86)	0.08
Penetrating injury (No = 0; Yes =1)	1.62 (0.70-3.75)	0.26	7.91 (1.46-42.99)	0.02
Spinal surgery (No = 0; Yes =1)	0.95 (0.45-2.01)	0.89	3.14 (0.94-10.46)	0.06
Pulmonary embolism (No = 0; Yes =1)	2.06 (0.18-23.34)	0.56	3.00 (0.16-57.88)	0.47
Mechanical ventilation (No = 0; Yes =1)	14.10 (4.56-43.62)	<0.001	26.39 (5.85-119.07)	<0.001

Supplemental Table 5: Univariate and multiple logistic regression analysis in motor complete patients (n=168). The coding of the variable categories is indicated in the table. (**Multiple** model: Nagelkerkes R^2 = 0.35, Hosmer-Lemeshow-Test p = 0.11). Abbreviations: AIS = ASIA impairment scale; CI= Confidence interval; OR = Odds ratio.