Core competencies in neurocritical care training in China: consensus developed by a national Deiphi consensus survey combined with

nominal group technique

Zhen Cui, MD, Liang Gao, MD, Qi-Bing Huang, MD, Li-Hong Li, MD, Bing-Hui Qiu, MD, Guang-Zhi Shi, MD, PhD, Xiang-You Yu, MD, Yan Wang, BS, Li Zhang, RN, Yu-Mei Wang, MD, Linlin Zhang, MD, PhD, Jian-Xin Zhou, MD, PhD, on behalf of the Working Group from Neuro-Critical Care Committee affiliated to the Chinese Association of Critical Care Physicians and the National Center for Healthcare Quality Management in Neurological Diseases.

Online Supplementary Appendix 2

Comparaison of core competencies established in the present study with those from other international bodies

Items in our core competencies	Overlap with other sources				
	UCNS	AAN	CoBaTrICE	CCICCM	
A. Neurological disease states					
1. Cerebrovascular diseases					
1.1. By the end of neurocritical care training, the trainee should be able to manage					
infarction and ischemia independently					
1.1.1. Massive hemispheric infarction	\checkmark				
1.1.2. Basilar artery occlusion and stenosis	\checkmark				

1.1.3. Carotid artery occlusion and stenosis	\checkmark	\checkmark	
1.1.4. Delayed cerebral ischemia			
1.2. By the end of neurocritical care training, the trainee should be able to manage			
intracerebral hemorrhage independently			
1.2.1. Supratentorial	\checkmark	\checkmark	
1.2.2. Cerebellar	\checkmark	\checkmark	
1.2.3. Brainstem	\checkmark	\checkmark	
1.2.4. Intraventricular	\checkmark	\checkmark	
1.2.5 Subarachnoid hemorrhage aneurysmal and others	\checkmark	\checkmark	
1.3. By the end of neurocritical care training, the trainee should be able to manage			
arteriovenous malformations independently	\checkmark		
1.4. By the end of neurocritical care training, the trainee should be able to manage			
carotidcavernous fistulae independently	\checkmark		
1.5. By the end of neurocritical care training, the trainee should be able to manage			
cervical and cerebral arterial dissections under supervision	\checkmark		
2. Neurotrauma			
2.1. By the end of neurocritical care training, the trainee should be able to manage			

traumatic brain injury independently			
2.1.1. Axonal shearing injury			
2.1.2. Epidural hematoma			
2.1.3. Subdural hematoma			
2.1.4. Contusions and lacerations			
2.1.5. Penetrating craniocerebral injuries			
2.1.6. Traumatic SAH			
2.2 By the end of neurocritical care training, the trainee should be able to manage spinal cord injury independently	\checkmark	\checkmark	\checkmark
3. Status epilepticus			
3.1. By the end of neurocritical care training, the trainee should be able to manage convulsive status epilepticus independently	V	V	
3.2. By the end of neurocritical care training, the trainee should be able to manage nonconvulsive status epilepticus independently	\checkmark	\checkmark	\checkmark
3.3. By the end of neurocritical care training, the trainee should be able to manage myoclonic epilepsy independently	1	\checkmark	\checkmark
4. Neuromuscular diseases			

4.1. By the end of neurocritical care training, the trainee should be able to manage	\checkmark	\checkmark	
4.2. By the end of neurocritical care training, the trainee should be able to manage			
GuillainBarré syndrome independently	\checkmark	\checkmark	
5. Infections			
5.1. By the end of neurocritical care training, the trainee should be able to manage	,		,
encephalitis (viral, bacterial, parasitic) independently	\checkmark	\checkmark	\checkmark
5.2. By the end of neurocritical care training, the trainee should be able to manage			
meningitis (viral, bacterial, parasitic) independently	V	N	\checkmark
5.3. By the end of neurocritical care training, the trainee should be able to manage			
brain and spinal epidural abscess under supervision	V		
6. Toxicmetabolic disorders			
6.1. By the end of neurocritical care training, the trainee should be able to manage	,		
drug overdose and withdrawal independently	\checkmark		
6.2. By the end of neurocritical care training, the trainee should be able to manage			
temperaturerelated injuries independently	V		
6.3. By the end of neurocritical care training, the trainee should be able to manage			

carbon monoxide poisoning and delayed encephalopathy independently			
7. Inflammatory and demyelinating diseases			
7.1. By the end of neurocritical care training, the trainee should be able to manage			
central pontine myelinolysis independently	N		
7.2. By the end of neurocritical care training, the trainee should be able to manage			
osmotic demyelination syndrome independently			
8. Encephalopathies			
8.1. By the end of neurocritical care training, the trainee should be able to manage	1		
hepatic encephalopathy independently	N		
8.2. By the end of neurocritical care training, the trainee should be able to manage			
hypoxicischemic encephalopathy independently	\checkmark		
8.3. By the end of neurocritical care training, the trainee should be able to manage			
metabolic encephalopathy independently			
8.4. By the end of neurocritical care training, the trainee should be able to manage			
hypertensive encephalopathy and posterior reversible encephalopathy syndrome	\checkmark		
(PRES) independently			
9. Neuroendocrine disorders		 	

9.1. By the end of neurocritical care training, the trainee should be able to manage				
pituitary apoplexy independently	V			
9.2. By the end of neurocritical care training, the trainee should be able to manage				
diabetes insipidus independently	V			
10. Movement disorders				
10.1. By the end of neurocritical care training, the trainee should be able to manage				
movement disorders (severe dystonia and opisthotonos) independently				
11. Clinical syndromes				
11.1. By the end of neurocritical care training, the trainee should be able to teach or				
supervise others to manages coma	\checkmark	\checkmark		\checkmark
11.2. By the end of neurocritical care training, the trainee should be able to manage				
herniation syndromes independentl	\checkmark		\checkmark	
11.3. By the end of neurocritical care training, the trainee should be able to manage				
elevated intracranial pressure independently	\checkmark		\checkmark	
11.4. By the end of neurocritical care training, the trainee should be able to manage				
intracranial hypotension/ hypovolemia independently	\checkmark		\checkmark	
11.5. By the end of neurocritical care training, the trainee should be able to manage	\checkmark	\checkmark	\checkmark	

hydrocephalus independently			
11.6. By the end of neurocritical care training, the trainee should be able to manage			
delirium independently	\checkmark		
12. Perioperative neurosurgical care			
12.1. By the end of neurocritical care training, the trainee should be able to manage			
postcraniotomy hypertension independently	\checkmark		
12.2. By the end of neurocritical care training, the trainee should be able to manage			
postcraniotomy pain independently	\checkmark		
12.3. By the end of neurocritical care training, the trainee should be able to manage			
wound cerebrospinal fluid (CSF) leaks independently	\checkmark		
12.4. By the end of neurocritical care training, the trainee should be able to manage			
wound infections independently			
12.5. By the end of neurocritical care training, the trainee should be able to manage			
postoperative brain edema independently	\checkmark		
12.6. By the end of neurocritical care training, the trainee should be able to manage			
postcraniotomy intracranial hemorrhage independently	\checkmark		
12.7. By the end of neurocritical care training, the trainee should be able to assess	\checkmark		

and manage postcervical spine surgery airway independently			
12.8. By the end of neurocritical care training, the trainee should be able to assess			
and manage highrisk postoperative neurosurgical patient independently	\checkmark	\checkmark	
13. By the end of neurocritical care training, the trainee should be able to conduct			
neurorehabilitation independently	\checkmark		
B. General medical disease states			
1. Cardiovascular			
1.1. By the end of neurocritical care training, the trainee should be able to recognize			
and manage different types of shock independently		\checkmark	
1.2. By the end of neurocritical care training, the trainee should be able to recognize			
and manage myocardial infarction and unstable coronary syndromes independently	\checkmark		
1.3. By the end of neurocritical care training, the trainee should be able to recognize			
and manage neurogenic cardiac disturbances (electrocardiographic changes, stunned	\checkmark		
myocardium) independently			
1.4. By the end of neurocritical care training, the trainee should be able to assess and			
manage lifethreatening arrhythmia independently	\checkmark	\checkmark	\checkmark
1.5. By the end of neurocritical care training, the trainee should be able to recognize			

and manage left ventricular failure and/or acute pulmonary edema independently				
1.6. By the end of neurocritical care training, the trainee should be able to recognize				
and manage neurogenic pulmonary edema independently	\checkmark			
1.7. By the end of neurocritical care training, the trainee should be able to manage				
hypertension crisis independently	\checkmark			\checkmark
1.8. By the end of neurocritical care training, the trainee should be able to perform				
and interpret cardiac output and hemodynamic monitor independently	\checkmark	\checkmark	\checkmark	\checkmark
1.9. By the end of neurocritical care training, the trainee should be able to perform				
electrocardiography and interprets the results independently			\checkmark	\checkmark
2. Respiratory				
2.1. By the end of neurocritical care training, the trainee should be able to assess and				
manage acute and chronic respiratory failure (type I and type II) independently	\checkmark			\checkmark
2.2. By the end of neurocritical care training, the trainee should be able to manage				
chronic obstructive pulmonary disease (COPD) and status asthmaticus under				
supervision				
2.3. By the end of neurocritical care training, the trainee should be able to recognize				
(diagnosis and grading) and manage acute respiratory distress syndrome (ARDS)	\checkmark		\checkmark	\checkmark

independently			
2.4. By the end of neurocritical care training, the trainee should be able to manage	,		
aspiration independently	\checkmark		
2.5. By the end of neurocritical care training, the trainee should be able to recognize			
and manage upper airway obstruction independently			\checkmark
2.6. By the end of neurocritical care training, the trainee should be able to recognize			
and manage bronchopulmonary infections independently	\checkmark		
2.7. By the end of neurocritical care training, the trainee should be able to recognize			
and manage pleural diseases (empyema, effusion, pneumothorax) independently			
2.8. By the end of neurocritical care training, the trainee should be able to recognize			
and manage neurogenic breathing patterns (central hyperventilation, CheyneStokes	\checkmark		
respirations, et cetera) independently			
2.9. By the end of neurocritical care training, the trainee should be able to assess and			
manage thromboembolic disease (including pulmonary embolism) under supervision			
independently			
2.10. By the end of neurocritical care training, the trainee should be able to interpret			
chest radiographs independently	\checkmark	\checkmark	\checkmark

2.11. By the end of neurocritical care training, the trainee should be able to interpret				
chest CT image independently				,
2.12. By the end of neurocritical care training, the trainee should be able to perform				
and interpret end tidal CO2 monitoring independently	\checkmark			
2.13. By the end of neurocritical care training, the trainee should be able to perform			,	
and interpret arterial blood gas analysis independently			\checkmark	
2.14. By the end of neurocritical care training, the trainee should be able to manage				
noninvasive and invasive echanical ventilation independently (indication, rational,	\checkmark	\checkmark	\checkmark	\checkmark
complication, and weaning)				
3. Renal				
3.1. By the end of neurocritical care training, the trainee should be able to assess and		ł		
manage fluid, electrolytes disorders independently	\checkmark		\checkmark	\checkmark
manage fluid, electrolytes disorders independently 3.2. By the end of neurocritical care training, the trainee should be able to recognize	√		√	√
manage fluid, electrolytes disorders independently 3.2. By the end of neurocritical care training, the trainee should be able to recognize (diagnosis and grading) and manage acute kidney injury independently	√ √		√ √	√ √
manage fluid, electrolytes disorders independently3.2. By the end of neurocritical care training, the trainee should be able to recognize(diagnosis and grading) and manage acute kidney injury independently3.3. By the end of neurocritical care training, the trainee should be able to recognize	√ √		N	√ √
 manage fluid, electrolytes disorders independently 3.2. By the end of neurocritical care training, the trainee should be able to recognize (diagnosis and grading) and manage acute kidney injury independently 3.3. By the end of neurocritical care training, the trainee should be able to recognize and manage derangements secondary to alterations in osmolality and electrolytes 	√ √ √		√ √	√ √

3.4. By the end of neurocritical care training, the trainee should be able to manage acidbase disorders independently	\checkmark	\checkmark	\checkmark
3.5. By the end of neurocritical care training, the trainee should be able to manage oliguria and polyuria independently	\checkmark		
3.6. By the end of neurocritical care training, the trainee should be able to manage rhabdomyolysis under supervision	\checkmark		
3.7. By the end of neurocritical care training, the trainee should be able to conduct drug dose adjustment in renal failure independently	\checkmark		\checkmark
3.8. By the end of neurocritical care training, the trainee should be able to manage cerebral salt wasting independently	\checkmark		
3.9. By the end of neurocritical care training, the trainee should be able to manage syndrome of inappropriate antidiuretic hormone (SAIDH) independently	\checkmark		
4. Metabolic and endocrine effects of critical illness			
4.1. By the end of neurocritical care training, the trainee should be able to manage			
diabetes mellitus (ketotic and hyperglycemic hyperosmolar coma, hypoglycemia)	\checkmark		
independently			
4.2. By the end of neurocritical care training, the trainee should be able to manage	\checkmark		

systemic inflammatory response syndrome (SIRS) independently				
4.3. By the end of neurocritical care training, the trainee should be able to perform	,	,	,	,
enteral/ parenteral nutritional support independently	V	V	N	V
4.4. By the end of neurocritical care training, the trainee should be able to manage				
pituitary crisis under supervision				
5. Infectious Disease				
5.1. By the end of neurocritical care training, the trainee should be able to comply				
with infection control measures independently	\checkmark		\checkmark	
5.2. By the end of neurocritical care training, the trainee should be able to perform				
antimicrobial agent selection and determine dose in critically ill patients	\checkmark		\checkmark	\checkmark
independently				
5.3. By the end of neurocritical care training, the trainee should be able to manage				
hospital acquired and opportunistic infections in the critically ill patient	\checkmark	\checkmark		\checkmark
independently				
5.4. By the end of neurocritical care training, the trainee should be able to assess and				
manage fever in critically ill patient independently	\checkmark			\checkmark
5.5. By the end of neurocritical care training, the trainee should be able to conduct	\checkmark			

interpretation of antibiotic concentrations and sensitivities independently				
5.6. By the end of neurocritical care training, the trainee should be able to recognize			,	,
and manage sepsis, severe sepsis, and septic shock independently			V	V
5.7. By the end of neurocritical care training, the trainee should be able to recognize				
and manage multidrug resistance bacteria infection independently				
5.8. By the end of neurocritical care training, the trainee should be able to perform				
antimicrobial agent selection in neurological infections independently				
6. Acute hematologic disorders				
6.1. By the end of neurocritical care training, the trainee should be able to manage				
disseminated intravascular coagulation under supervision	\checkmark			\checkmark
6.2. By the end of neurocritical care training, the trainee should be able to conduct				
anticoagulation and fibrinolytic therapy independently	V	\checkmark		\checkmark
6.3. By the end of neurocritical care training, the trainee should be able to conduct				
blood component therapy independently	V		\checkmark	\checkmark
6.4. By the end of neurocritical care training, the trainee should be able to conduct				
hemostatic therapy independently	\checkmark			
6.5. By the end of neurocritical care training, the trainee should be able to recognize	\checkmark			

and manage hypercoagulable states under supervision				
6.6. By the end of neurocritical care training, the trainee should be able to recognize				
and manage traumatic coagulopathy independently				V
7. Acute gastrointestinal and genitourinary disorders				
7.1. By the end of neurocritical care training, the trainee should be able to assess and				
manage gastrointestinal bleeding independently	\checkmark			\checkmark
7.2. By the end of neurocritical care training, the trainee should be able to prescribe				
stress ulcer prophylaxis independently				\checkmark
7.3. By the end of neurocritical care training, the trainee should be able to assess and				
manage abdominal compartment syndrome independently	\checkmark			
8. Immunology and transplantation				
8.1. By the end of neurocritical care training, the trainee should be able to interpret				
principles of transplantation (brain death, organ donation, procurement, maintenance	\checkmark	\checkmark	\checkmark	
of organ donors, implantation) under supervision				
9. General trauma and burns				
9.1. By the end of neurocritical care training, the trainee should be able to assess and				
provide initial management of the trauma patient independently	\checkmark		\checkmark	\checkmark

9.2. By the end of neurocritical care training, the trainee should be able to manage	1		
spine and pelvis trauma independently	N		
9.3. By the end of neurocritical care training, the trainee should be able to manage			
chest and abdominal trauma independently	\checkmark		
9.4. By the end of neurocritical care training, the trainee should be able to manage			
crush syndrome independently			
9.5. By the end of neurocritical care training, the trainee should be able to describe			
burns and electrical injury independently		\checkmark	
10. Transport			
10.1 By the end of neurocritical care training, the trainee should be able to teach of		,	
supervises patient assessment before transport		V	V
10.2. By the end of neurocritical care training, the trainee should be able to prepare			
equipment for transport independently			
10.3. By the end of neurocritical care training, the trainee should be able to perform			
intrahospital transport independently			\checkmark
11. Others			
11.1. By the end of neurocritical care training, the trainee should be able to assess		 	

\checkmark		
\checkmark		\checkmark
		,
\checkmark		V
\checkmark		
\bigvee		

dioxide production, respiratory quotient)				
1.7. By the end of neurocritical care training, the trainee should be able to conduct				
multimodality monitoring in NICU independently	\checkmark			
2. General critical care practical procedures and therapeutic interventions				
2.1. By the end of neurocritical care training, the trainee should be able to perform				
arterial catheterisation independently	\checkmark	\checkmark	\checkmark	
2.2. By the end of neurocritical care training, the trainee should be able to teach or				
supervise others central venous catheter insertion	\checkmark	\checkmark	\checkmark	\checkmark
2.3. By the end of neurocritical care training, the trainee should be able to conduct				
vasoactive/inotropic medication therapy independently	\checkmark		\checkmark	\checkmark
2.4. By the end of neurocritical care training, the trainee should be able to teach or				
supervise others to perform cardiopulmonary resuscitation, postresuscitation brain	2/		2	al
protection, to provide advanced life support for postresuscitation patient	v		v	v
2.5. By the end of neurocritical care training, the trainee should be able to teach or				
supervise others to perform cardioversion and defibrillation			\checkmark	\checkmark
2.6. By the end of neurocritical care training, the trainee should be able to perform				
airway maintenance and ventilation in nonintubated/unconscious patients	\checkmark	\checkmark	\checkmark	\checkmark

independently				
2.7. By the end of neurocritical care training, the trainee should be able to perform	,	,		,
tracheal intubation independently	V	V		
2.8. By the end of neurocritical care training, the trainee should be able to perform				
difficult and failed airway management independently			\checkmark	
2.9. By the end of neurocritical care training, the trainee should be able to perform				
and interpret intraabdominal pressure monitor independently				\checkmark
2.10. By the end of neurocritical care training, the trainee should be able to teach or				
supervise others to perform tracheal aspiration				
2.11. By the end of neurocritical care training, the trainee should be able to teach or			,	,
supervise others to perform oxygen therapy			V	
2.12. By the end of neurocritical care training, the trainee should be able to perform				
fibreoptic bronchoscopy and bronchoalveolar lavage in the intubated patient under	\checkmark		\checkmark	
supervision				
2.13. By the end of neurocritical care training, the trainee should be able to explain				,
and perform recruitment maneuver: principle and practice under supervision				
2.14. By the end of neurocritical care training, the trainee should be able to perform	\checkmark		\checkmark	

thoracocentesis via a chest drain independently				
2.15. By the end of neurocritical care training, the trainee should be able to perform				
percutaneous tracheostomy independently			\checkmark	
2.16. By the end of neurocritical care training, the trainee should be able to				
performsbedside ultrasound to localize pleural effusion and ascites under supervision				\checkmark
2.17. By the end of neurocritical care training, the trainee should be able to assess				
inferior caval vein by ultrasound under supervision				
2.18. By the end of neurocritical care training, the trainee should be able to perform				
ultrasound techniques for vascular localisation independently			\checkmark	
2.19. By the end of neurocritical care training, the trainee should be able to perform				
thyrocricocentesis under supervision				
3. Neurocritical care practical procedures and therapeutic interventions				
3.1. By the end of neurocritical care training, the trainee should be able to perform				
lumbar puncture independently	\checkmark	\checkmark	\checkmark	\checkmark
3.2. By the end of neurocritical care training, the trainee should be able to perform				
shunt and ventricular drain tap for CSF sampling independently	\checkmark			
3.3. By the end of neurocritical care training, the trainee should be able to manage				

external ventricular drains independently				
3.4. By the end of neurocritical care training, the trainee should be able to assess and			1	1
manage pain of neurocritical care patients independently	V	V	V	N
3.5. By the end of neurocritical care training, the trainee should be able to assess				
sedation and describe principle it independently	\checkmark			
3.6. By the end of neurocritical care training, the trainee should be able to interpret	,	,		
and manage of ICP and cerebral perfusion pressure data independently	\checkmark	\checkmark		
3.7. By the end of neurocritical care training, the trainee should be able to interpret				
saturation and jugular venous oxygenation and brain tissue oxygen data under	\checkmark			
supervision				
3.8. By the end of neurocritical care training, the trainee should be able to perform				
systemic moderate hypothermia under supervision	V			
3.9. By the end of neurocritical care training, the trainee should be able to manage				
fluid and conduct osmotic dehydration treatment independently				
3.10. By the end of neurocritical care training, the trainee should be able to perform				
and interpret cerebral multimodality monitoring (pH, partial pressure of carbon	\checkmark	\checkmark		
dioxide [pCO ₂], laser Doppler, microdialysis) under supervision				

3.11. By the end of neurocritical care training, the trainee should be able to perform				
lumbar drain insertion independently	\checkmark			
3.12. By the end of neurocritical care training, the trainee should be able to manage				
and insert ICP monitoring independently	\checkmark			
3.13. By the end of neurocritical care training, the trainee should be able to manage				
cerebral oximetric or perfusion monitoring under supervision	\checkmark	\checkmark		
3.14. By the end of neurocritical care training, the trainee should be able to perform				
brain ventricle puncture under supervision				
3.15. By the end of neurocritical care training, the trainee should be able to interpret				
CT/MRI of nervous system under supervision	\checkmark			
3.16. By the end of neurocritical care training, the trainee should be able to choose				
neuromuscular blockade and describe indication of it under supervision			\checkmark	
D.Professionalism and system management				
1. By the end of neurocritical care training, the trainee should be able to gather				
accurate, essential information from all sources, including medical interviews,				
physical examinations, medical records and Laboratory and radiological results			\checkmark	\checkmark
independently				

2. By the end of neurocritical care training, the trainee should be able to integrate				
clinical findings with laboratory investigations to form a differential diagnosis	\checkmark		\checkmark	\checkmark
independently				
3. By the end of neurocritical care training, the trainee should be able to involve				
patients (or their surrogates if applicable) in decisions about care and treatment	\checkmark	\checkmark	\checkmark	\checkmark
(including informed consent and endoflife care) independently				
4. By the end of neurocritical care training, the trainee should be able to promote				
collaborative practice independently, including multidisciplinary cooperation and	\checkmark		\checkmark	
effective team working				
5. By the end of neurocritical care training, the trainee should be able to ensure				
continuity of care through effective handover of clinical information independently			\checkmark	\checkmark
6. By the end of neurocritical care training, the trainee should be able to describe				
implications of chronic and comorbid disease in the acutely ill patient independently			\checkmark	\checkmark
7. By the end of neurocritical care training, the trainee should be able to seek learning				
opportunities and integrate new knowledge into clinical practice independently	\checkmark		\checkmark	\checkmark
8. By the end of neurocritical care training, the trainee should be able to apply				
knowledge to clinical problem solving, clinical decision making, and critical thinking	\checkmark		\checkmark	

independently.			
9. By the end of neurocritical care training, the trainee should be able to develop a			
clinically applicable knowledge of the basic and clinical sciences that underlie the	\checkmark		
practice of neurointensive care			
10. By the end of neurocritical care training, the trainee should be able to provide			
effective and professional consultation to physicians and health care professionals of	\checkmark		
other specialty independently			
11. By the end of neurocritical care training, the trainee should be able to maintain			
accurate medical records and documentation independently	\checkmark	\checkmark	\checkmark
12. By the end of neurocritical care training, the trainee should be able to			
communicate the continuing care requirements of patients at ICU discharge to health		\checkmark	
care professionals, patients and relatives under supervision			
13. By the end of neurocritical care training, the trainee should be able to manage the			
safe and timely discharge of patients from ICU independently		\checkmark	\checkmark
14. By the end of neurocritical care training, the trainee should be able to identify and			
minimise risk of critical incidents and adverse events independently			\checkmark
15. By the end of neurocritical care training, the trainee should be able to recognize	\checkmark		

and identifys deficiencies in peer performance independently				
16. By the end of neurocritical care training, the trainee should be able to identify				
environmental hazards and promote safety for patients and staff independently			\checkmark	
17. By the end of neurocritical care training, the trainee should be able to				
communicate effectively with patients, relatives and members of the healthcare team	\checkmark		\checkmark	\checkmark
independently				
18. By the end of neurocritical care training, the trainee should be able to respect				
privacy, dignity, confidentiality, and legal constraints on the use of patient data			\checkmark	\checkmark
19. By the end of neurocritical care training, the trainee should be able to				
demonstrate sensitivity and responsiveness to gender, age, culture, religion, sexual				
preference, socioeconomic status, beliefs, behaviors and an awareness of their impact	\checkmark		\checkmark	
on decision making				
20. By the end of neurocritical care training, the trainee should be able to				
demonstrate respect, compassion, integrity, and altruism in relationships with	\checkmark			
patients, families, and colleagues				
E. Ethical and legal aspects of critical care medicine				
1. By the end of neurocritical care training, the trainee should be able to evaluate	\checkmark	\checkmark	\checkmark	

death and dying, and perform brainstem death testing under supervision			
2. By the end of neurocritical care training, the trainee should be able to manage			
palliative care of the critically ill patient, forgo lifesustaining treatment and order not	\checkmark	\checkmark	
to resuscitate under supervision			
3. By the end of neurocritical care training, the trainee should be able to apply and			
describe practice to minimizes the physical and psychosocial consequences of critical		\checkmark	\checkmark
illness for patients and families under supervision			
4. By the end of neurocritical care training, the trainee should be able to formulate			
clinical decisions with respect for ethical and legal principles independently	\checkmark	\checkmark	\checkmark
5. By the end of neurocritical care training, the trainee should be able to adhere to			
principles of confidentiality, scientific/academic integrity, and informed consent			
independently			
F. Principles of research and certification			
1. By the end of neurocritical care training, the trainee should be able to perform			
presentation independently	\checkmark		
2. Certification			
2.1 By the end of neurocritical care training, the trainee should acquire the			\checkmark

certification of basic life support		
2.2 By the end of neurocritical care training, the trainee should acquire the		
certification of advanced cardiac life support		
G. Scoring systems		
1. General status scoring		
1.1. By the end of neurocritical care training, the trainee should be able to describe		
and assess patient with acute physiology and chronic health evaluation II score		\checkmark
independently		
1.2. By the end of neurocritical care training, the trainee should be able to describe		
and assess patient with simplified acute physiology score II score independently		
2. Organs scoring		
2.1. By the end of neurocritical care training, the trainee should be able to describe		
and assess patient with acute kidney injury scoring (KDIGO) independently		
2.2. By the end of neurocritical care training, the trainee should be able to describe		
and assess patient with sequential organ failure assessment score independently		
3. Sedation, pain and delirium scoring		
3.1. By the end of neurocritical care training, the trainee should be able to teach and		

supervise others to perform CriticalCare Pain Observation Tool independently		
3.2. By the end of neurocritical care training, the trainee should be able to describe		
and assess patient with Richmond AgitationSedation Scale independently		
3.3. By the end of neurocritical care training, the trainee should be able to describe		
and assess patient with the confusion assessment method for the diagnosis of		
delirium in the ICU independently		
3.4. By the end of neurocritical care training, the trainee should be able to describe		
and assess patient with selfrating anxiety scale independently		
4. Neural system scoring		
4.1 By the end of neurocritical care training, the trainee should be able to teach and		
supervise others to perform Glasgow Coma Scale		
4.2 By the end of neurocritical care training, the trainee should be able to describe		
and assess patient with National Institute of Health Stroke Scale independently		

UCNS: United Council for Neurologic Subspecialties, AAN: American Academy of Neurology, CCICCM: Chinese College of Intensive and Critical Care Medicine, CoBaTrICE: Competencybased Training Programme in ICM for Europe