

Candidate Study Guide for the Illinois Trauma Nurse Specialist (TNS) Examination

The following information is intended to help you prepare for the Illinois Trauma Nurse Specialist (TNS) Examination. Part I of this study guide contains general information about the profession and testing procedures. Part II provides a content outline that lists the competencies covered in this examination, identifies abbreviations that may appear in the TNS exams, and provides reference norms for the test. Part III includes sample questions to help you prepare for this test.

Part I General Information

PURPOSE OF THE EXAMINATION

This examination has been developed in collaboration with Illinois Department of Public Health (IDPH) and the Trauma Nurse Specialist Course Coordinators. Certification is granted only to candidates who demonstrate sufficient knowledge of the Illinois Trauma Nurse Specialist (TNS) Program as approved by IDPH.

TEST VALIDITY

The time limit for this examination is 2½ hours. This examination has been developed to meet strict standards of test fairness and validity to protect the health and safety of the public. A committee of TNS course coordinators has validated each question that appears in this study guide and all TNS exams that are administered in behalf of the Illinois Department of Public Health.

PHOTO ID

Each candidate must present a photo ID and a valid admission notice to be admitted to any of these examinations. Only a valid Driver's License, Secretary of State ID card, or a current passport is acceptable as photographic identification. If the name on the photo ID does not match the name on the admission notice, proof of legal name change also must be presented before the candidate can be admitted to an examination.

SPECIAL ACCOMODATIONS

Any candidate who needs special accommodations in test-taking procedures because of a disabling condition must communicate that need in writing with his or her application. No accommodations can be arranged on the day of a test.

SCORING THE EXAMINATION

Candidates who pass this examination will receive certification as a TNS from the Illinois Department of Public Health.

MISSING AN EXAMINATION

There are no "make-up" examinations. You may re-register for the next scheduled examination date.

RE-EXAMINATION

Candidates who fail the test will receive information to help them identify content areas on which they need to improve their performance to pass on a subsequent attempt. Candidates must register to take the test again through one of the regional TNS course coordinators throughout Illinois.

Part II Test Content Outline

This examination was developed in collaboration with a committee of TNS course coordinators from and staff from the Illinois Department of Public Health. Content areas on the test are outlined below. Each subtopic is a module in the TNS curriculum.

Trauma Nurse Certification (TNS)	(Revised 10/07)
1. Professional Issues and Pathophysiology	(28 questions)
A. EMS/Trauma systems development	2 questions
B. Legal considerations for trauma management	5 questions
C. Cardiac anatomy and physiology	5 questions
D. Fluids and electrolytes	6 questions
E. Neurological anatomy and physiology	5 questions
F. Respiratory anatomy and physiology	5 questions
2. General Assessment and Management	(32 questions)
A. Airway access	5 questions
B. Arterial blood gases (ABGs) and acid base	3 questions
C. Patient assessment and management	8 questions
D. Shock and complications of post shock and trauma	12 questions
E. Kinematics	4 questions
3. Head, Neck and Spine Trauma	(24 questions)
A. Traumatic brain injury	8 questions
B. Ocular and oral maxillofacial trauma	8 questions
C. Spinal cord injury	8 questions
4. Torso and Extremity Trauma	(26 questions)
A. Abdominal trauma	6 questions
B. Genitourinary (GU) trauma	4 questions
C. Musculoskeletal, vascular and soft tissue trauma	8 questions
D. Thoracic trauma	7 questions
E. Zonal injuries of the neck	1 question
5. Thermal Trauma	(11 questions)
A. Burns	8 questions
B. Cold injury	3 questions
6. Special Populations	(17 questions)
A. Pediatric trauma	9 questions
B. Trauma and older adults	4 questions
C. Trauma in pregnancy	4 questions
7. Special Considerations in Trauma Patient Management	(12 questions)
A. Family violence	5 questions
B. Organ and tissue transplants	3 questions
C. Stabilization and transfer	4 questions

Abbreviations

The following abbreviations may appear in the Trauma Nurse Specialist (TNS) Examinations.

AAA	abdominal aortic aneurism
ABCs	airway, breathing/ventilation, circulatory status
ABG	arterial blood gases
ACE	angiotensin-converting enzyme
ACS	acute coronary syndrome
ADA	Americans with Disabilities Act
ADH	antidiuretic hormone
AED	automated external defibrillator
AIDS	acquired immune deficiency syndrome
AIVR	accelerated idioventricular rhythm
ALS	Advanced Life Support
AMA	against medical advice
AMI	acute myocardial infarction
AMS	altered mental status
APGAR	appearance, pulse, grimace, activity, respirations
A&O	alert and oriented
AP	anteroposterior
ARDS	adult respiratory distress syndrome
ASA	aspirin
ATN	acute tubular necrosis
ATP	adenosine triphosphate (body's energy source)
AV	atrioventricular
AVPU	Mental status responsiveness check: alert, responds to verbal or painful stimuli, unresponsive
BID	two times per day
BLS	Basic Life Support
BP or B/P	blood pressure
BPM	beats per minute
BSA	body surface area
BSI	body substance isolation
BUN	blood urea nitrogen
BVM	bag valve mask
°C	degrees Centigrade
CAD	coronary artery disease
CC	chief complaint
c-collar	cervical collar
CDC	Center for Disease Control and Prevention
CHF	congestive heart failure
CISD	critical incident stress debriefing
CISM	critical incident stress management
cm	centimeter
CN	cranial nerve
CNS	central nervous system
c/o	complains of or complaining of
CO	carbon monoxide
CO ₂	carbon dioxide
COBRA	Consolidated Omnibus Budget Reconciliation Act (federal legislation providing for EMTALA and continuation of health insurance)

Abbreviations (continued)

COPD	chronic obstructive pulmonary disease
CPAP or C-PAP	continuous positive airway pressure
CPR	cardiopulmonary resuscitation
CQI	continuous quality improvement
CSF	cerebral spinal fluid
c-spine	cervical spine
CT	computed tomography
CVD	cardiovascular disease
CVP	central venous pressure
D ₅ W	5% dextrose in water
D ₅₀ W	50% dextrose in water
DAI	diffuse axonal injury
D/C	discontinue
DCAP-BTLS	deformities, contusions, abrasions, punctures/penetrations, burns, tenderness, lacerations, swelling
DCFS	Department of Children and Family Services
DI	diabetes insipidus
DIC	disseminated intravascular coagulation
DKA	diabetic ketoacidosis
dl or dL	deciliter
DNR	do not resuscitate
DPL	diagnostic peritoneal lavage
DOA	dead on arrival
DOE	dyspnea on exertion
DT	delirium tremens
DOT	Department of Transportation
Dx	diagnosis
ECG or EKG	electrocardiogram
ECRN	Emergency Communications Registered Nurse
ED	emergency department
EDD	esophageal detector device
EEG	electroencephalogram
EMS	Emergency Medical Services
EMS MD	Emergency Medical Services Medical Director
EMTALA	Emergency Medical Treatment and Labor Act
EOMs	extraocular movements
mEq/L	milli-equivalents per liter
ET	endotracheal
EtCO ₂	End tidal CO ₂
ETOH	alcohol
ETT	endotracheal tube
°F	degrees Fahrenheit
FAST	focused abdominal sonography
FB	foreign body
FFP	fresh frozen plasma
FiO ₂	fraction of inspired oxygen (oxygen percentage delivered)
Fr	French (suction, urinary or chest tube catheter diameter)
Fx	fracture
GCS	Glasgow Coma Score
GI	gastrointestinal

Abbreviations (continued)

gm	gram
GSW	gunshot wound
gtts/min	drops per minute
GU	genitourinary
h	hour
H	hydrogen
H ₂ O	water
HCO ₃	bicarbonate
Hazmat	hazardous materials
HCO ₃	bicarbonate
HCT, Hct	hemocrit
HEENT	head, eyes, ears, nose and throat
HEPA mask	high efficiency particulate airborne mask
HHN	hand held nebulizer
HHNC	hyperglycemic hyperosmolar nonketotic coma
HHNK	hyperglycemic hyperosmolar nonketotic
HHNS	hyperosmolar hyperglycemic nonketotic syndrome
HIPAA	Health Insurance Portability and Accountability Act
HIS	common bundle bridging AV node to bundle branches
HIV	human immunodeficiency virus
HR	heart rate
HTN	hypertension
Hx	history
ICP	intracranial pressure
ICS	incident command system
ICU	intensive care unit
IDPH	Illinois Department of Public Health
ILS	Intermediate Life Support
IM	intramuscular
IMS	incident management system
IN	intranasal
IO	intraosseous
IR	intrarectal
IV	intravenous
IVP	intravenous push
IVPB	intravenous piggy back
IVR	idioventricular
J	joules
JVD	jugular venous distension
KED	Kendrick extrication device
kg	kilogram
L	liter
lbs	pounds
LLQ	lower left quadrant
LMA	laryngeal mask airway
LMP	last menstrual period
L/min or lpm	liters per minute
LOC	level of consciousness
LR	lactated Ringers solution
LUQ	left upper quadrant

Abbreviations (continued)

mA	milliamps
MAP	mean arterial pressure
mcg	microgram
mcggtts	microdrops
MCI	multiple casualty incident
MDI	metered dose inhaler
mEq	milli-equivalents
MERCI	Medical Emergency Radio Communications of Illinois
mg	milligram
MI	myocardial infarction
min	minute
mL or ml	milliliters
MMF	maxillo-mandibular fixation
mmHg	millimeters of mercury
MODS	multi-system organ dysfunction syndrome
MOI	mechanism of injury
mph	miles per hour
MVC	motor vehicle collision or crash
NaCl	sodium chloride
NC	nasal cannula
NIH	National Institutes of Health
NOE	nasal-orbital-ethmoid
NPA	nasopharyngeal airway
NPO	nothing by mouth
NRB	non-rebreather mask
NS	normal saline
NSAID	nonsteroidal anti-inflammatory drug
NSR	normal sinus rhythm
NTG	nitroglycerin
N/V	nausea/vomiting
O ₂	oxygen
OB	obstetric
OG/NG tube	orogastric/nasogastric tube
OPA	oropharyngeal airway
OPQRST	onset, provokes, quality, radiation, severity, time
OR	operating room
Oriented X 1	oriented to person
Oriented X 2	oriented to person and place
Oriented X 3	oriented to person, place and time
Oriented X 4	oriented to person, place, time and event
OSHA	Occupational Health and Safety Administration
P	pulse
PAC	premature atrial contraction
Palp	palpation
PALS	pediatric advanced life support
PaO ₂	partial pressure of oxygen (arterial blood)
PASG	pneumatic anti-shock garment
PCA	Patient Controlled Analgesia
PCO ₂ , pCO ₂	partial pressure of carbon dioxide
PCR	patient care report

Abbreviations (continued)

SL	sublingual
SOB	shortness of breath
SOMI	Sternal Occipital Mandibular Immobilizer
SpO ₂	pulse oximetry
S-T or ST	S-T segment
START	simple triage and rapid treatment
STD	sexually transmitted disease
Sub-q	subcutaneous
SVT	supraventricular tachycardia
T or Temp	temperature
TBI	traumatic brain injury
TBSA	total body surface area
TENS	transcutaneous electrical nerve stimulation
TID	three times per day
TKO	to keep open
TPN	total parenteral nutrition
TSH	thyroid-stimulating hormone
TT	tetanus toxoid
Tx	treatment
U	unit
URI	upper respiratory infection
UTI	urinary tract infection
VAP	ventilator associated pneumonia
V-fib or VF	ventricular fibrillation
V _A /Q	ventilation (alveolar)/perfusion
VS	vital signs
V-tach or VT	ventricular tachycardia
WAP	wandering atrial pacemaker
WMD	weapons of mass destruction
WNL	within normal limits
w/o	without
WOB	work of breathing
y/o	year old

Reference Norms

Intrinsic pacing rates	SA node	60-100
	AV node	40-60
	Ventricles	20-40
PR interval	0.12 – 0.20 seconds	
QRS duration	0.04 – 0.10 seconds	
Carotid pulse =	minimum systolic BP of 60 mmHg	
Femoral pulse =	minimum systolic BP of 70 mmHg	
Radial pulse =	minimum systolic BP of 80 mmHg	
Upper limits of pacing mA =	200	

Airway treatment questions reference AHA 2005 ACLS Guidelines

Peds fluid resuscitation volumes are calculated at 20 mL/kg

1 lb = 2.2 kg

Part III Sample Questions

All questions on this examination are multiple-choice with one correct answer. Each question is supported by the Trauma Nurse Specialist Program that is used to train TNS candidates. The answer key appears after these questions.

1. An adult presents to a Level II trauma center. The trauma surgeon identifies an epidural hematoma and closed femur fracture, declares these isolated injuries, consults orthopedics and neurosurgery for immediate operative intervention, and signs off the case. Orthopedics arrives 55 minutes after being contacted and decides to repair the femur concurrently with the neurosurgical case. Anesthesia is delayed for 30 minutes. The neurosurgeon arrives 90 minutes after being consulted and both the craniotomy and femur repair begin 2.5 hours after patient arrival. Based on Illinois rules, which provider met the Level II requirements?

 - A. Neurosurgeon
 - B. Trauma surgeon
 - C. Anesthesiologist
 - D. Orthopedic surgeon
2. Which TNS action demonstrates a breach of duty?

 - A. 15 L of O₂/NRM is given to a trauma patient c/o dyspnea.
 - B. A GCS drop of three points is not reported to the neurosurgeon.
 - C. Vital signs are taken every five minutes on an unstable trauma patient.
 - D. Trauma scores are documented on patient admission and discharge from the ED.
3. What does a central venous pressure of 2 mmHg reflect in an adult with multiple trauma?

 - A. Pulmonary edema or ARDS
 - B. High right atrial or vena caval pressures
 - C. Hypovolemia and need for fluid resuscitation
 - D. Myocardial ischemia from low aortic root pressures
4. Which IV solution is isotonic?

 - A. LR
 - B. D₅₀W
 - C. Mannitol
 - D. 3% NaCl
5. Which of these would cause vasodilation of cerebral blood vessels?

 - A. pO₂ 60 mmHg
 - B. pO₂ 90 mmHg
 - C. pCO₂ 30 mmHg
 - D. pCO₂ 40 mmHg

6. Which of these conditions increases anatomic dead space?
 - A. Upper airway obstruction
 - B. Pulmonary embolism
 - C. Atelectasis
 - D. Epiglottitis

7. Which airway access method is indicated for an adult who presents with massive facial trauma, no detectable nasal or oral openings, and extremely labored ventilations with loud gurgling sounds?
 - A. Repositioning of the mandible and oropharyngeal airway
 - B. In-line orotracheal intubation
 - C. Nasotracheal intubation
 - D. Cricothyrotomy

8. An adult presents to the ED after being struck in the abdomen with a baseball bat. FAST exam shows a massive splenic hemorrhage. ABG results: pH 6.9, pCO₂ 42, pO₂ 80, HCO₃ 18. Base deficit – 12 mEq/L. VS: BP 94/60, P 130. What is the definitive intervention for this patient?
 - A. Surgery to stop the hemorrhage
 - B. Administration of blood products
 - C. Drug assisted intubation and hyperventilation
 - D. Administration of a large volume of 0.9 NS IV fluid

9. Which of these is included in the primary survey?
 - A. Percussing the abdomen
 - B. Obtaining a SAMPLE history
 - C. Maintaining cervical spine control
 - D. Checking extra-ocular eye movements

10. Which of these is **NOT** part of the clotting process?
 - A. Vascular phase
 - B. Arterial phase
 - C. Platelet phase
 - D. Coagulation

11. An adult with a flail chest develops increasing dyspnea and dropping pulse oximetry values. Initial blood gases show respiratory alkalosis. Chest x-ray reveals generalized haziness over all lung fields. What should a TNS suspect?
 - A. Septic shock
 - B. Pleural effusions
 - C. Bilateral pneumothoraces
 - D. Pulmonary contusion and ARDS

12. Which of these is associated with an anterior compression injury to the abdomen?
- A. Ruptured diaphragm
 - B. Small bowel tear
 - C. Renal laceration
 - D. Aortic tear
13. An adult presents with a GCS of 4 and unilaterally dilated pupil following head trauma. VS: BP 94/58, P 146, R 12 and irregular. The patient is positioned supine with head elevated on two pillows. The airway is patent and O₂ was given at 6L/NC. An IV of LR was started and 2 L infused. A bolus of 250 mL of 7.5% NaCl with Dextran was given to improve BP and reduce cerebral edema. VS and LOC were assessed and recorded hourly using the GCS. Which of these complied with the Brain Trauma Foundation Guidelines?
- A. Positioning
 - B. Fluid resuscitation
 - C. Airway and ventilatory support
 - D. Continued monitoring and documentation
14. Which facial fracture is most likely to have an associated CSF leak?
- A. Maxillary ridge
 - B. Orbital blowout
 - C. LeFort III
 - D. Zygoma
15. A patient with a spinal cord injury presents with no movement in the feet or legs, no sensation over the chest or abdomen, and weak flexion of the elbows. At what level is the disruption?
- A. Cervical
 - B. Thoracic
 - C. Lumbar
 - D. Sacral
16. Which patient requires an exploratory laparotomy?
- A. Superficial stab wound to the anterior abdomen
 - B. MVC victim presenting with positive Battle's sign
 - C. Encapsulated hematoma of the kidney following blunt trauma
 - D. Gunshot wound to the abdomen from a medium velocity weapon

17. Which of these is the most common MOI for anterior urethral tears in a male?
- A. Self-instrumentation
 - B. Straddle injury
 - C. Stabbing
 - D. GSW
18. An adult sustained a crush injury to the lower leg two hours ago and is now c/o intense throbbing pain in the calf. The pain worsens when the great toe is passively extended. Which intervention is most appropriate?
- A. Prepare for a fasciotomy.
 - B. Administer more pain medication.
 - C. Elevate the leg and apply cold packs.
 - D. Apply warm moist towels to enhance local tissue perfusion.
19. Which emergent resuscitative intervention is indicated first for a patient with thoracic trauma that presents with severe ventilatory distress, absent breath sounds and hyperresonance to percussion on one side, distended neck veins, and hypotension?
- A. Pericardiocentesis
 - B. Chest tube insertion
 - C. Needle pleural decompression
 - D. ABGs and a portable chest x-ray
20. Which of these is the most important assessment tool when evaluating a penetrating injury to the neck?
- A. Angiography
 - B. Esophagrams
 - C. Color flow Doppler
 - D. Physical examination
21. What is the most accurate indicator in the first 24 hours of effective fluid resuscitation and restored peripheral perfusion in a severely burned patient?
- A. Hematocrit
 - B. Hourly vital signs
 - C. Hourly urine output
 - D. Trends in SpO₂ reading

22. Which intervention is indicated for an adult with a core temperature of 88°F (31°C) and a perfusing bradycardia at 40 bpm?
- A. Atropine up to 3 mg IVP
 - B. External transcutaneous pacing
 - C. CPR with compressions at 100/minute
 - D. Rewarming and volume replacement with NS
23. Which of these is most useful in assessing for adequate tissue perfusion in children?
- A. Signs of blood loss
 - B. Urinary output
 - C. Temperature
 - D. SBP
24. Which dysrhythmia is more common as conduction changes occur in the SA node in the aging heart?
- A. Atrial fibrillation
 - B. Atrial decelerations
 - C. Ventricular fibrillation
 - D. Ventricular tachycardia
25. Which of these is an indication for an emergency caesarean section?
- A. Fetal demise at 12 weeks gestation
 - B. After fetal heart tones have been confirmed
 - C. Post-mortem within 20 minutes of maternal death
 - D. Uterine size prevents adequate treatment of an unstable mother
26. Which of these should cause a TNS to suspect domestic violence or adult abuse?
- A. Epidural hematoma after striking head in a MVC
 - B. Splenic rupture after falling from a standing height
 - C. Humerus and rib fractures after a bicycle crash at touring speed
 - D. Pelvis fracture sustained after falling from a thoroughbred horse
27. An adult potential organ donor presents with VS: BP 106/50; P 96; R: 12 per vent; 40% FiO₂; T 99.2°F rectally. CVP is 14; urine output has been 1 ml/kg/hr. ABG: pH 7.32, pCO₂ 45, pO₂ 65. What order should the TNS anticipate?
- A. Administer IV vasopressin.
 - B. Increase IV fluid administration rate.
 - C. Increase oxygen delivery to 50% FiO₂.
 - D. Apply a cooling blanket and administer acetaminophen.

28. Which of these most accurately describes EMTALA?
- A. The law applies only to hospital EDs.
 - B. The hospital is responsible for compliance.
 - C. Provisions do not apply in life-threatening situations.
 - D. A physician must perform the emergency medical screening exam.

Answers for TNS Sample Questions

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|-----|---|-----|---|
| 1. | D | 15. | A |
| 2. | B | 16. | D |
| 3. | C | 17. | B |
| 4. | A | 18. | A |
| 5. | A | 19. | C |
| 6. | B | 20. | D |
| 7. | D | 21. | C |
| 8. | A | 22. | D |
| 9. | C | 23. | B |
| 10. | B | 24. | A |
| 11. | D | 25. | D |
| 12. | A | 26. | B |
| 13. | B | 27. | C |
| 14. | C | 28. | B |