



CEREBROSPINAL FLUID

[CSF]

All question is compulsory

Minimum passing mark is **15** .

1. Full form of
 - a) CSF = _____
 - b) LDH = _____
 - c) ADA = _____
2. If patient serum glucose level is 300 mg% ,than expected csf glucose level is _____ mg%
3. Normal CSF LDH level is _____ IU/L.
4. For diagnosis of tuberculosis, _____ is most sensitive parameter.
5. CSF is turbid in case of
 1. Pyogenic meningitis
 2. Tuberculos meningitis
 3. Viral meningitis
 4. A & B
6. Red colour of CSF indicate presence of _____ cells

Question

7. CSF lactate is indicator of
 7. Infection
 8. Trauma
 9. Hypoxic injury
 10. malignancy
8. Most common cause of very low glucose level in CSF is _____ .
9. Write 3 cause of high protein level in CSF.
10. Higher neutrophilic cells in CSF is suggestive of _____ infection.
11. Lumber puncture is mostly done between ____ & ____ vertebra .

CEREBROSPINAL FLUID

THE CEREBROSPINAL FLUID [CSF] IS A CLEAR, COLORLESS TRANSPARENT, TISSUE FLUID PRESENT IN THE CEREBRAL VENTRICLES, SPINAL CANAL, AND SUBARACHNOID SPACES.

FUNCTIONS OF CSF

1. SHOCK ABSORBER
2. MECHANICAL BUFFER
3. ACT AS CUSHION BETWEEN THE BRAIN AND CRANIUM
4. ACT AS A RESERVOIR AND REGULATES THE CONTENTS OF THE CRANIUM
5. SERVES AS A MEDIUM FOR NUTRITIONAL EXCHANGE IN CNS
6. TRANSPORT HORMONES AND HORMONE RELEASING FACTORS
7. REMOVES THE METABOLIC WASTE PRODUCTS.

CEREBROSPINAL FLUID FORMATION

FORMED BY THE CHOROID PLEXUS OF THE LATERAL VENTRICLE & THIRD AND FOURTH VENTRICLES.

THE CHOROID PLEXUS OF THE VENTRICLES ACTIVELY SECRETE CEREBROSPINAL FLUID.

MECHANISM OF FORMATION OF CSF

RATE OF FORMATION:

20-25 ML/HOUR

550 ML/DAY IN ADULTS.

TURNS OVER 3.7 TIMES A DAY

TOTAL QUANTITY:

150 ML

30-40 ML = VENTRICLES

110-120 ML = SUBARACHNOID SPACE

[75-80 ML IN SPINAL & 25-30 ML IN THE CRANIAL PART].

PHYSICAL CHARACTERISTIC OF CSF

NORMAL

COLOUR = COLOURLESS

APPEARANCE = TRANSPARENT, CLEAR

SPECIFIC GRAVITY = 1.004 - 1.007

REACTION = ALKALINE AND DOES NOT
COAGULATE

PRESSURE = 60-150 MM OF H₂O

PHYSICAL CHARACTERISTICS :

1) COLOUR:

- NORMAL: COLOURLESS
- ABNORMAL:
 - PINK: SLIGHT AMOUNT OF OXYHEMOGLOBIN
 - ORANGE: HEAVY HEMOLYSIS
 - YELLOW: BILIRUBIN

2) APPEARANCE:

- NORMAL: CLEAR
 - CRYSTAL CLEAR: VIRAL INFECTION
 - TURBID: PRESENCE OF WBC/PROTEIN/PUS CELL
: PRESENCE OF ANY INFECTION
 - BLOODY: HEMOLYZED RBC
: LUMBER PUNCTURE TRAUMA, HAEMORRHAGE,
CEREBRAL MALIGNANCY

COMPOSITION OF CSF

PROTEINS	=	20-40 MG%
GLUCOSE	=	2/3 OF PLASMA OR 50-65 MG%
LDH	=	1/5 OF SERUM OR 20 – 80 IU/L
LACTIC ACID	=	18.0 MG%
CHLORIDE	=	116 – 122 MMOL/L
ADA	=	UPTO 5 IU/L

CSF MICROSCOPIC EXAMINATION

WBC

NORMAL = 4 – 5 CELLS

INCREASE = INFECTION, INFLAMMATION

NEUTROPHIL = BACTERIAL INFECTION,
ACUTE SUPPURATIVE MENINGITIS.

LYMPHOCYTE = VIRAL INFECTIONS

ENCEPHALITIS

SYPHILIS

TUBERCULOUS MENINGITIS

CSF MICROSCOPIC EXAMINATION

RBC

NORMAL = 4 – 5 CELLS

INCREASE = HAEMORRAGE – STROKE

MALIGNANCY

TRAUMATIC

TRAUMA DURING LUMBER PUNCTURE

TRAUMA DURING LUMBER PUNCTURE

SUCH BLOOD STAINS THE FLUID THAT IS DRAWN INITIALLY AND CLEARS GRADUALLY. IF IT DOES NOT CLEAR, BLOOD INDICATES SUBARACHNOID HEMORRHAGE.

CSF IN VARIOUS CLINICAL CONDITIONS

CAUSE	APPEARANCE	CELLS	PROTEIN	GLUCOSE
<u>PYOGENIC BACTERIAL INFECTION</u>	YELLOWISH, TURBID	NEUTROPHIL INCREASED	VERY HIGH	DECREASED NEARLY ZERO
<u>VIRAL INFECTION</u>	CLEAR FLUID	LYMPHOCYTE INCREASED	SLIGHTLY INCREASED OR NORMAL	NORMAL
<u>TUBERCYLOUS INFECTION</u>	YELLOWISH AND VISCOUS	LYMPHOCYTE INCREASED	INCREASED	BORDER LINE LOW

CSF PROTEINS

NORMAL PROTEIN : 20 – 40 MG%

MODERATE INCREASE (150-200 MG/DL)

- INFLAMMATORY DISEASES OF MENINGES (BACTERIAL/VIRAL MENINGITIS, ENCEPHALITIS),
- INTRACRANIAL TUMORS
- SUBARACHNOID HEMORRHAGE,
- CEREBRAL INFARCTION.

SEVERE INCREASE

- GUILLAIN-BARRÉ SYNDROME
-

CSF GLUCOSE

NORMAL

VIRAL MENINGITIS

LOW GLUCOSE

BACTERIAL MENINGITIS (NEARLY ZERO)

TUBERCULOSIS MENINGITIS

FUNGAL INFECTION

DISSEMINATION OF TUMORS.

GLUCOSE IS CONSUMED BY LEUKOCYTES AND TUMOR CELLS.

CSF ADA

NORMAL
UPTO 5 IU/L

HIGHER
TUBERCULOSIS MENINGITIS

CSF LACTATE

HIGHER LEVEL
BIRTH ASPHAXIA
HYPOXIC BRAIN INJURY

LUMBAR PUNCTURE

PROCEDURE TO COLLECT A SAMPLE OF CEREBROSPINAL FLUID .

CSF IS MAINLY USED TO DIAGNOSE

- MENINGITIS [AN INFECTION OF THE MENINGES].
- SOME OTHER CONDITIONS OF THE BRAIN AND SPINAL CORD.

PRECAUTIONS FOR LUMBAR PUNCTURE

- ASKED TO SIGN A CONSENT FORM
- ASK ABOUT TAKING ANY MEDICINES
- ARE ALLERGIC TO ANY MEDICINES
- HAVE / HAD ANY BLEEDING PROBLEMS
- ASK ABOUT MEDICATIONS SUCH AS ASPIRIN OR WARFARIN
- ASK THE FEMALE PATIENT MIGHT BE PREGNANT
- EMPTY THE BLADDER BEFORE THE PROCEDURE

COMPLICATION OF LUMBAR PUNCTURE

POST LUMBAR PUNCTURE HEADACHE FOR 2 TO 7 DAYS.

THE PAIN IS RELIEVED BY LYING FLAT.

TREATMENT CONSISTS OF BED REST AND FLUID WITH SIMPLE ANALGESICS.

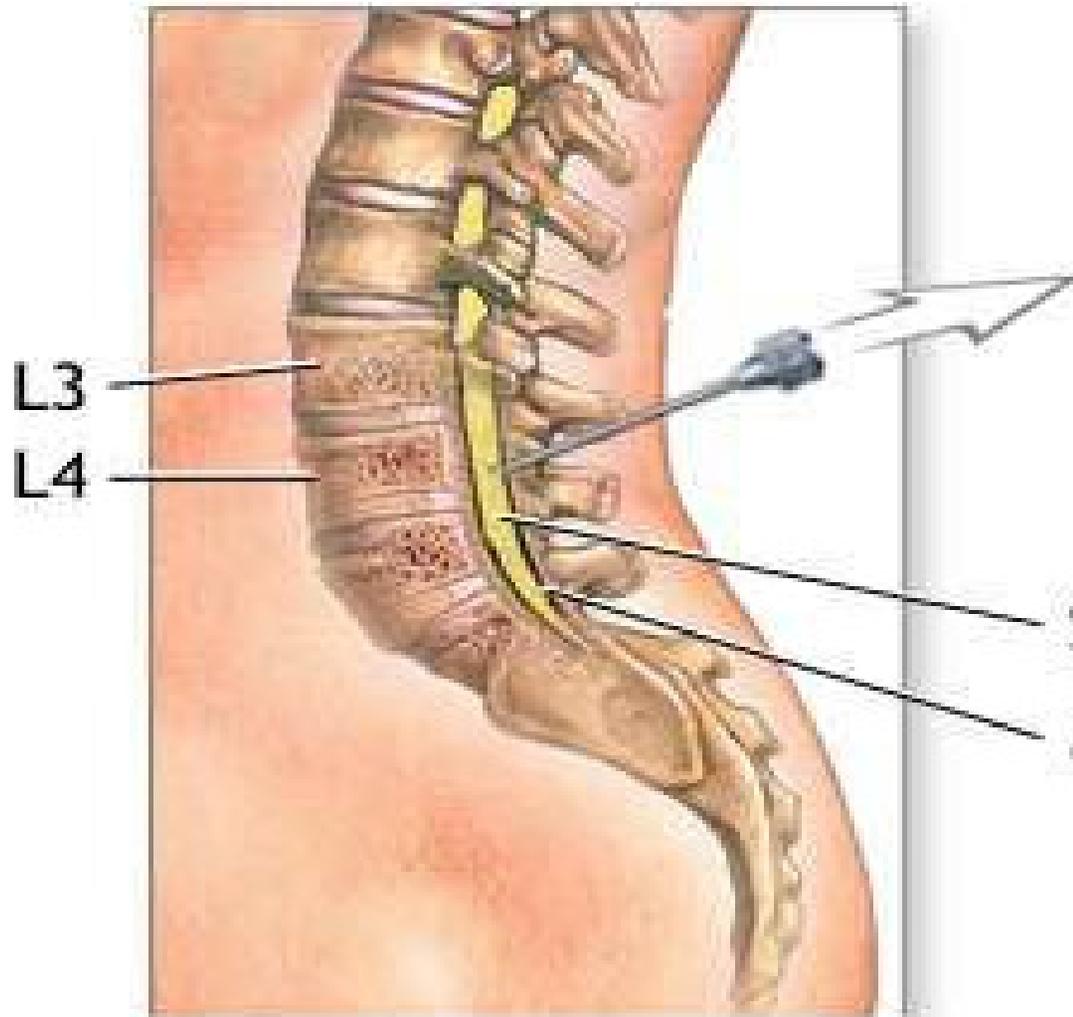
POSITION FOR LUMBER PUNCTURE

Cerebrospinal fluid drawn
from between two vertebrae



SITE FOR LUMBER PUNCTURE

Lumbar puncture



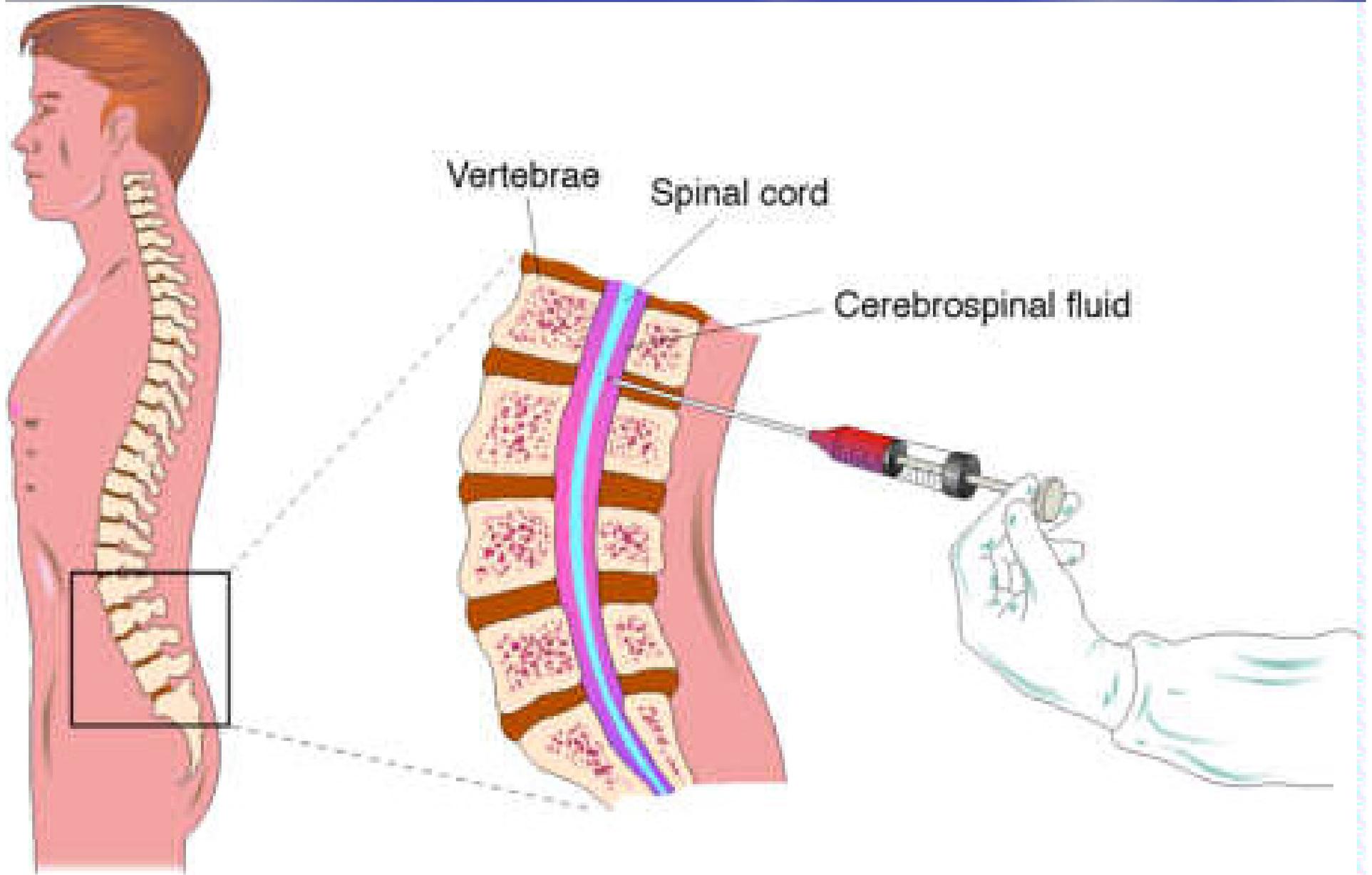
CSF

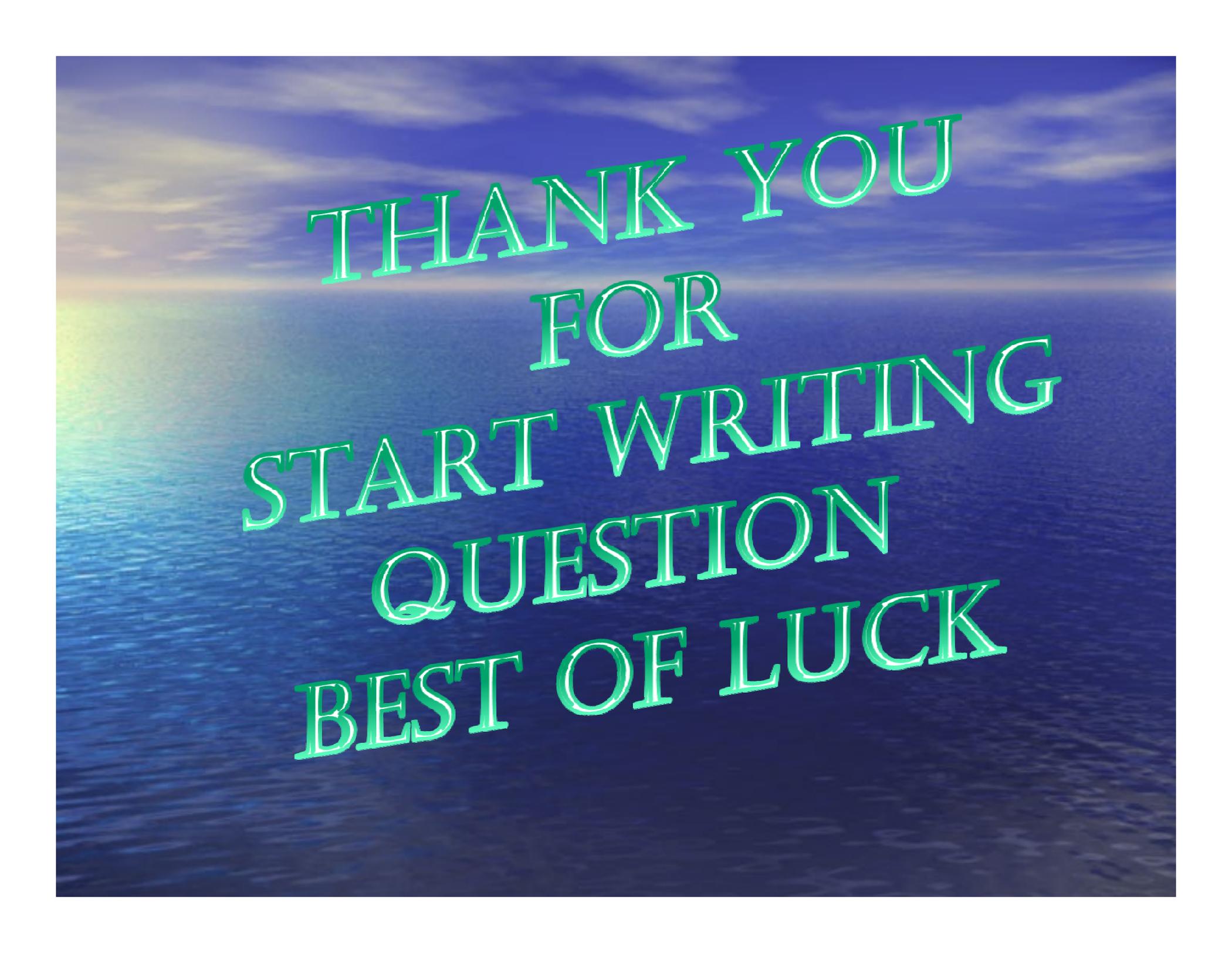


Spinal cord

Meninges

SITE FOR LUMBER PUNCTURE





THANK YOU
FOR
START WRITING
QUESTION
BEST OF LUCK