

# PSM-DERMA-ANESTHESIA

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## EXTRA-EDGE

# PSM

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2. A new estrogen receptor agonist is being evaluated for the treatment of postmenopausal symptoms. A prospective study shows that the drug increases the risk of deep vein thrombosis (DVT) in treated women who smoke compared to untreated women who smoke, with a relative risk (RR) of 1.70 and p-value of 0.01. In nonsmokers, no increased risk of DVT is evident with use of the drug (RR = 0.96; p-value = 0.68). Which of the following describes this phenomenon?

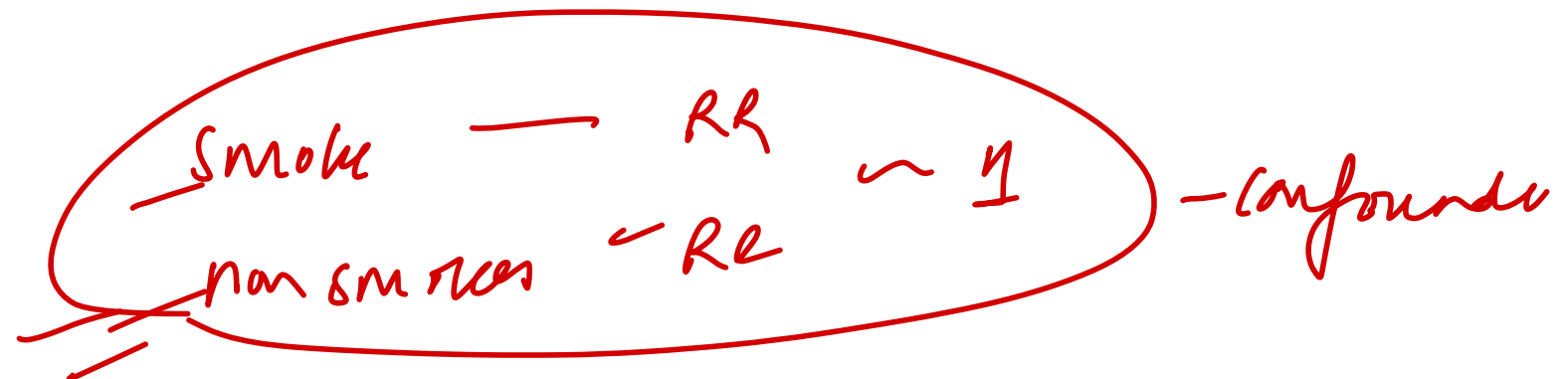
A) Confounding

B) Effect modification

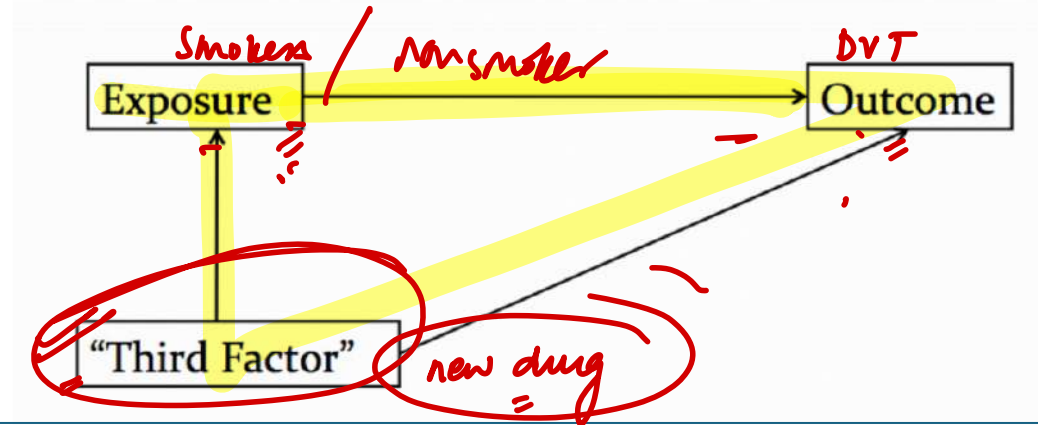
C) Latent period

D) Observer bias

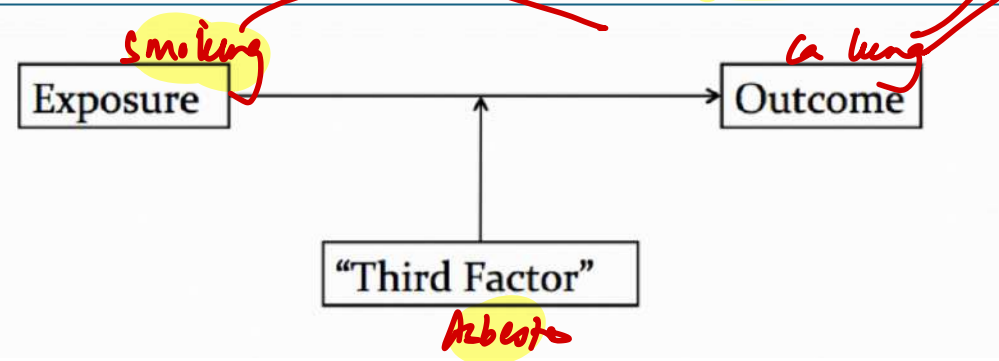
~~1.7~~ ~~p=0.01~~



# CONFOUNDING VS EFFECT MODIFICATION



Association disappears/weakens after stratification



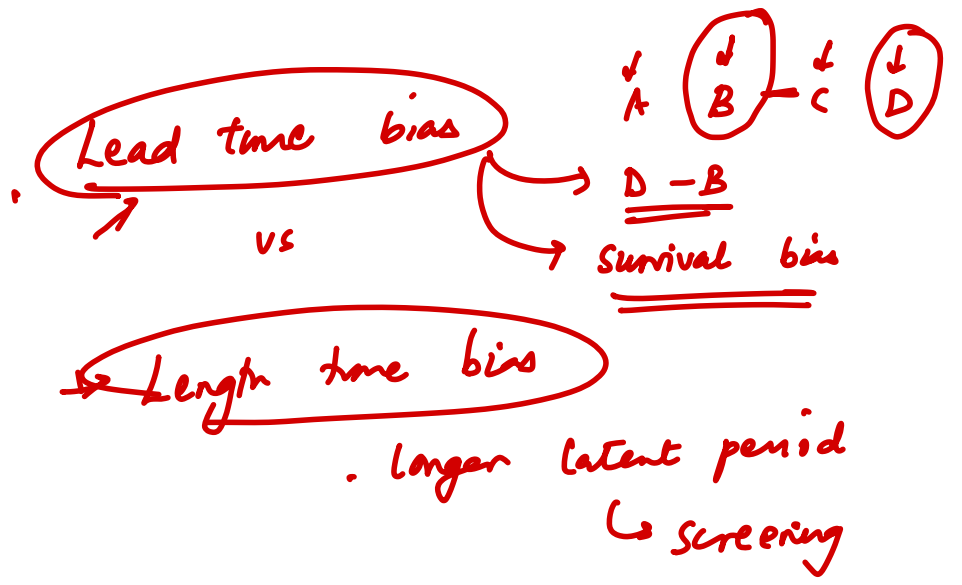
Association was strong in one subgroup with weak/no association in the other subgroup.

Best to eliminate known confounders: *Matching*

Known + Unknown:

- Randomization
- Restriction
- Stratification
- Stratified randomization
- Multivariate analysis/ Statistical modelling

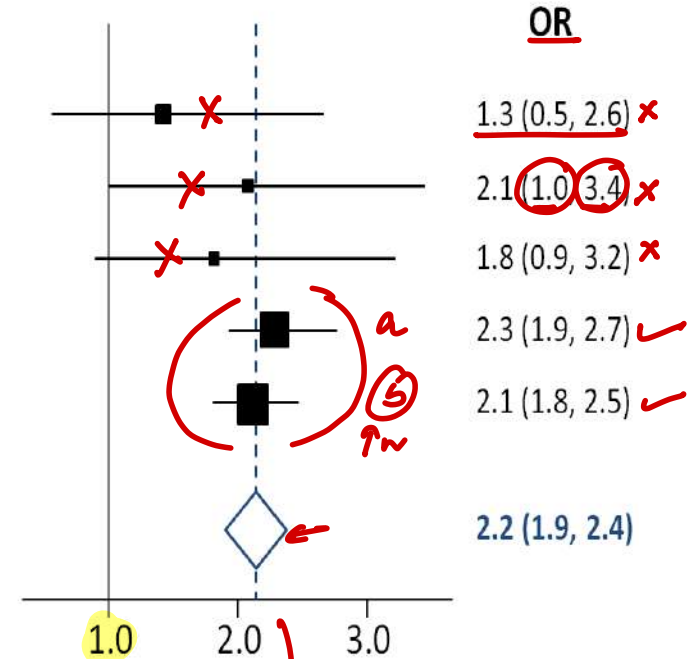
Overall best for confounders: *stratified randomization*



# 17. Which among the given statements is incorrect regarding the interpretation of these plots?

- A) The diamond shows the overall pooled results (T)
- B) Each rectangle depicts a single study (T)
- C) The vertical dashed line is the "line of no effect" (F)
- D) The size of the rectangle denotes the sample size (T)

Smith et al. 1991  
 Jones et al. 1993  
 Smith et al. 1999  
 Ng et al. 2004  
 Chu et al. 2009



- apples & oranges effect  
 - file drawer effect → missed data of individual study  
 public bias

$CI = \text{mean} \pm 2SE$

$SE = \frac{SD}{\sqrt{n}}$

no effect  
 pooled estimate

↑n ↓SE

18. An investigator is conducting a randomized, double-blind, placebo-controlled **intention-to-treat** clinical trial of a new drug for the treatment of peripheral neuropathy in adults with multiple myeloma (MM). One hundred fifty patients with MM are enrolled in the trial and randomized to receive either the new drug (n = 75) or placebo (n = 75). Trial protocol requires that patients in both groups take 1 pill per day and keep a pain diary. After 3 months of treatment, each patient is interviewed, and the pain diaries are reviewed; 9 patients taking the new drug and 3 patients taking placebo did not take the pills as instructed. Which of the following best describes how the data pertaining to all patients who did not adhere to protocol should be treated?

A) Conduct separate analyses of the 12 nonadherent patients and the ~~138~~ adherent patients

B) Exclude all 12 nonadherent patients from analysis ~~X~~

C) Exclude the 3 nonadherent patients in the group taking placebo from analysis ~~X~~

~~D) Keep all 12 nonadherent patients in their respective groups for analysis~~

→ FDA

Feature	<u>Intention-to-Treat (ITT)</u>	<u>Per-Protocol (PP)</u>	<u>As-Treated (AT)</u>
Who is analyzed?	Everyone as randomized	Only those who <u>fully adhered to the protocol</u>	<u>Based on treatment actually received</u>
Maintains randomization?	✓ Yes	✗ No	✗ No
Risk of bias	✓ Low	✗ High (selection bias)	✗ High (confounding, selection bias)

30. Which of the following is not a measure of position?

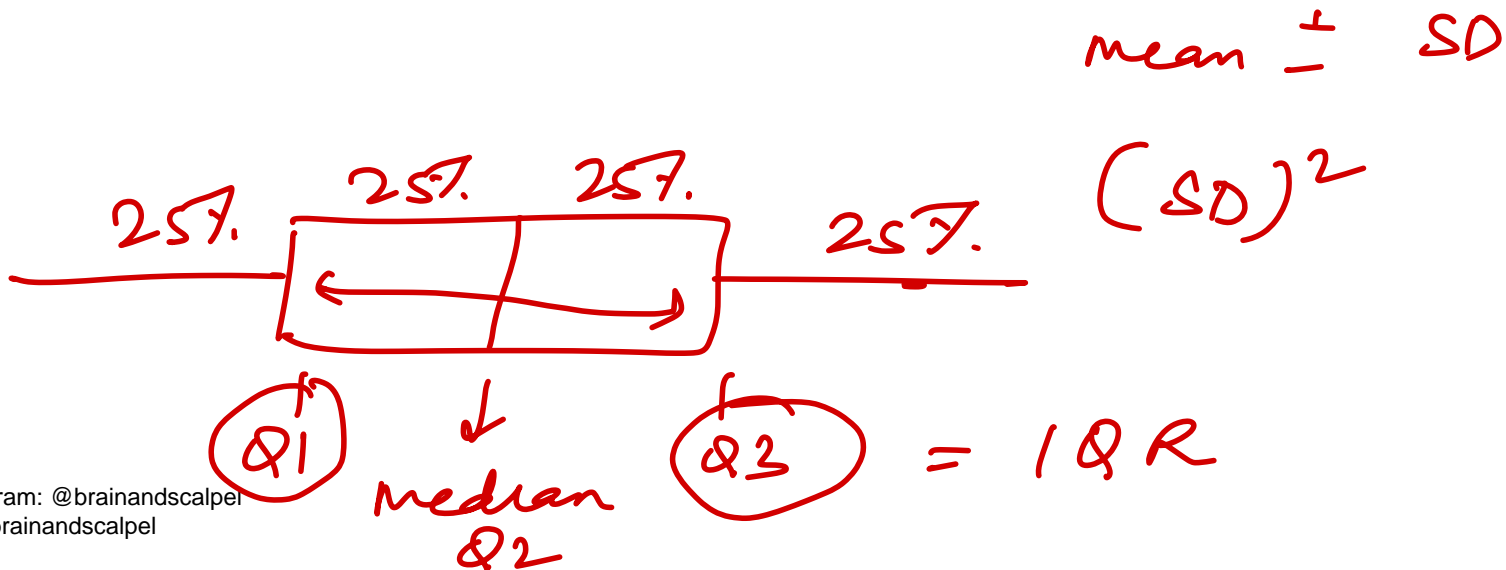
A) Z scores ●

B) Range

C) Centiles ●

D) Quantiles ●

Measures Used in Statistics	Examples
Measures of <u>Location</u> or <u>Central Tendency</u>	Mean, median, mode
Measures of <u>Dispersion</u> or <u>Variability</u> or <u>Spread</u>	✓ Range, <u>interquartile range</u> , <u>variance</u> , <u>standard deviation</u>
Measures of <u>Position</u>	Percentiles, quartiles, centiles, z-scores



32. Which of the following is not used to compare Kaplan Meir survival curves?

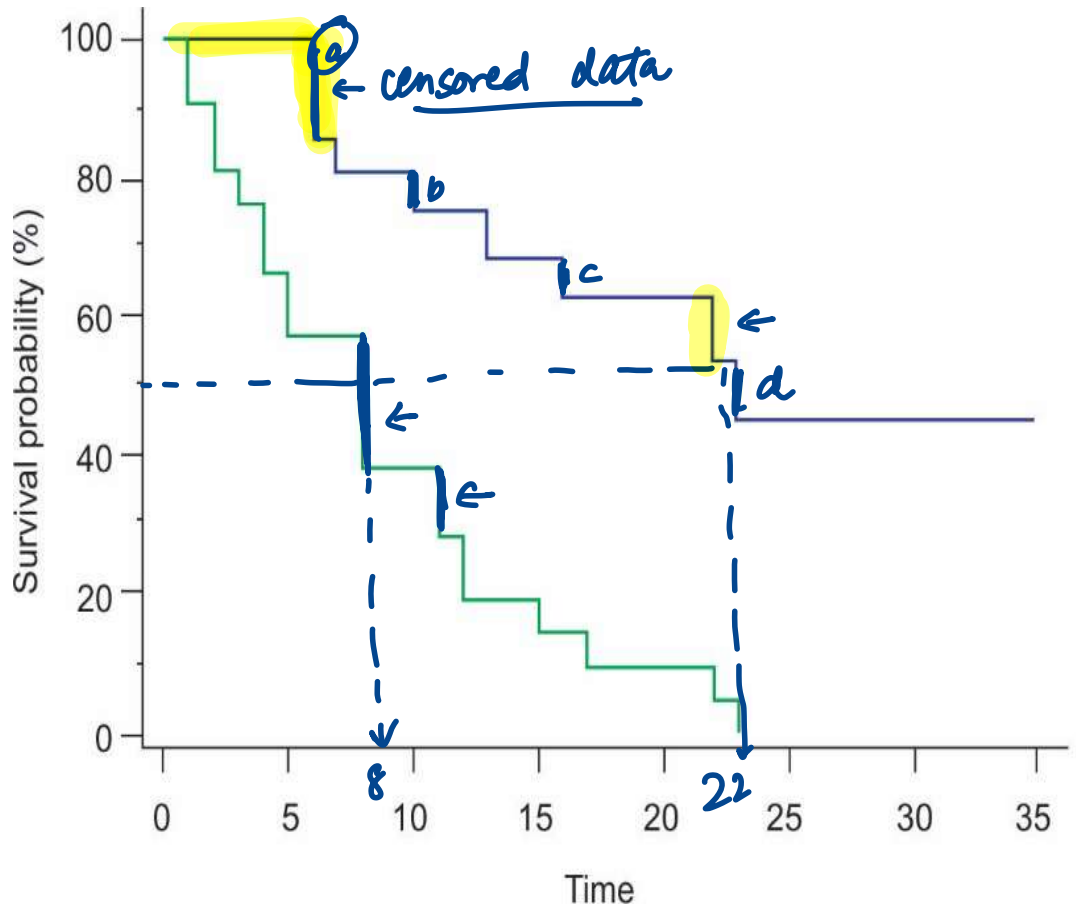
A) Mantel-Haenszel test

B) Log-rank test

C) Cox regression

~~D) Friedmann test~~

# Kaplan-Meier survival analysis



- median survival of group 1
- censored data

40. A study calculated the correlation coefficient between smoking and lung cancer incidence as 1.4. What does this result indicate?

- A) Weak correlation
- B) Moderate correlation
- C) Strong correlation
- D) Mistake in calculation

Pearson  
 $r$ : 0 = 1  
weak stronger

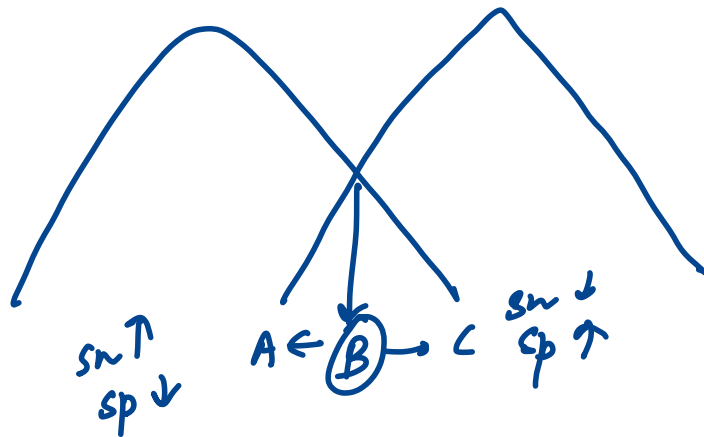
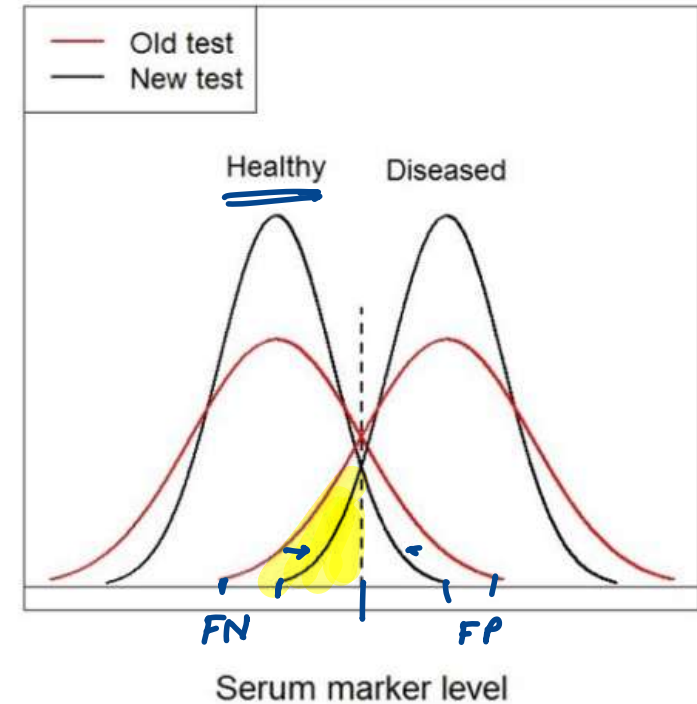
+  
Cause

-  
protect

OR / RR  
RR = 1 → no assn  
> 1 → "Cause"  
< 1 ⇒ protective

46. A standard test based on a serum marker is used to diagnose disease X. The distribution of the marker for this standard test in healthy and diseased patients is shown by the red curves in the graph below. A competitive company developed a new test based on the same marker. The distribution of the marker for the new test in healthy and diseased patients is shown by the black curves in the graph below. Compared to the old test, the new test has?

- A) Higher sensitivity and lower specificity
- B) Higher sensitivity and higher specificity
- C) Higher sensitivity and the same specificity
- D) Lower sensitivity and higher specificity



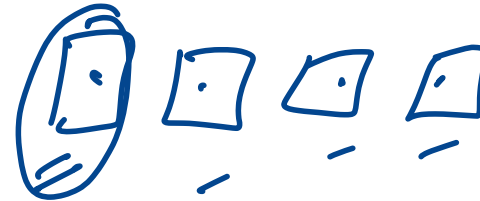
$FN \downarrow$   
 $SN \uparrow$   $NAV \uparrow$

$FP \downarrow$   
 $CP \uparrow$   $PPV \uparrow$

10. A research laboratory develops a new serologic test for detecting prostate cancer. The new assay is compared to biopsy. It is found that the test result is negative in 95% of patients who do not have the disease. If the new assay is used on 8 blood samples taken from patients without prostate cancer, what is the probability of all 8 test results coming back negative?

- A)  $0.05 \times 8$
- B)  $0.95 \times 8$
- C)  $0.05$  (raised to power 8)
- D)  $0.95$  (raised to power 8)

$$0.95 \times 0.95 \dots$$



Rule	Keywords to watch
Addition	<b>OR</b> , mutually exclusive
Multiplication	<b>AND</b> , independent events



Rule	Description	Example
<b>The Addition Rule</b>	(p) of any one of several particular events occurring = the <b>sum of their individual probabilities</b> , provided the events cannot both happen and are <b>mutually exclusive</b> .	Probability of <u>picking a heart card</u> from a deck is <u>0.25</u> and that of picking a <u>club</u> is <u>0.25</u> . Thus the p ( <b>hearts or clubs</b> ) is <u>0.25 + 0.25 = 0.50</u> .
<b>The Multiplication Rule</b>	(p) of two or more <b>statistically independent events</b> all occurring = <b>product of their individual probabilities</b> .	If the lifetime probability of a person developing a lung neoplasm is 0.25 and the lifetime probability of developing dementia is 0.01, then the p ( <b>lung neoplasm and dementia</b> ) is $0.25 \times 0.01 = 0.0025$ .

45. Out of a family of 4 members, one of them developed influenza infection. Four days later, 2 other members developed the same. What is the secondary attack rate?

A) 50%

B) 33%

~~C) 66%~~

D) 75%

$$\text{attack rate} = \frac{\text{new cases}}{\text{pop}^n \text{ at risk}} \times \underline{\underline{100}}$$

(Incidence  
(info))

$$\frac{2}{3} \times 100$$

$$\text{SAR} = \frac{\text{exposed in 1 ip}}{\text{pop}^n \text{ at risk} - \text{CONTACTS}} \times 100$$

33. In the context of Hardy-Weinberg equilibrium, which of the following factors does not affect the genetic equilibrium of a population?

A) Small population ✓

~~B) Random mating~~

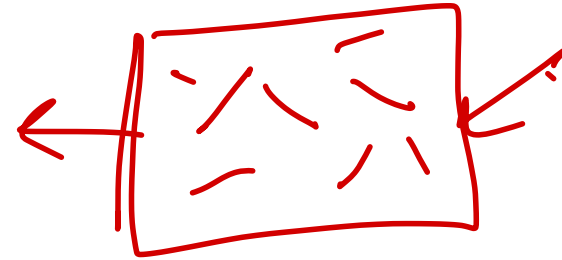
C) Mutations ✓

D) Gene outflow ✓

Stable

## Exceptions to Hardy-Weinberg law

- Small and dynamic populations
- Non-random or assortative mating
- Mutations
- Gene outflow and genetic drift
- Migration



47. A 10-year-old boy with complaints of dry, itchy eyes and night blindness had the following ophthalmic finding as given in the image. What is the stage of vitamin A deficiency as per WHO classification?



ulcer

- A) Stage X1B
- B) Stage X3
- C) Stage X2
- D) Stage XF

WHO

Stage	Features
XN	Night blindness <i>earliest L/F</i>
X1A ✓	Conjunctival Xerosis <i>earliest signs</i>
X1B	Bitot's spots <i>most sp signs</i>
X2	<u>Corneal xerosis</u> → <i>Rose Bengal</i>
X3A	<u>Corneal ulceration</u> affecting < 1/3 of the corneal surface
X3B	<u>Corneal ulceration</u> affecting > 1/3 of the corneal surface
XS	<u>Corneal scar</u>
XF	<u>Xerophthalmic fundus</u>

49. What is the correct sequence of steps in investigating an epidemic?

1. Confirm epidemic existence
2. Verify the diagnosis
3. Formulation of hypothesis
4. Define the population at risk
5. Rapid search of cases

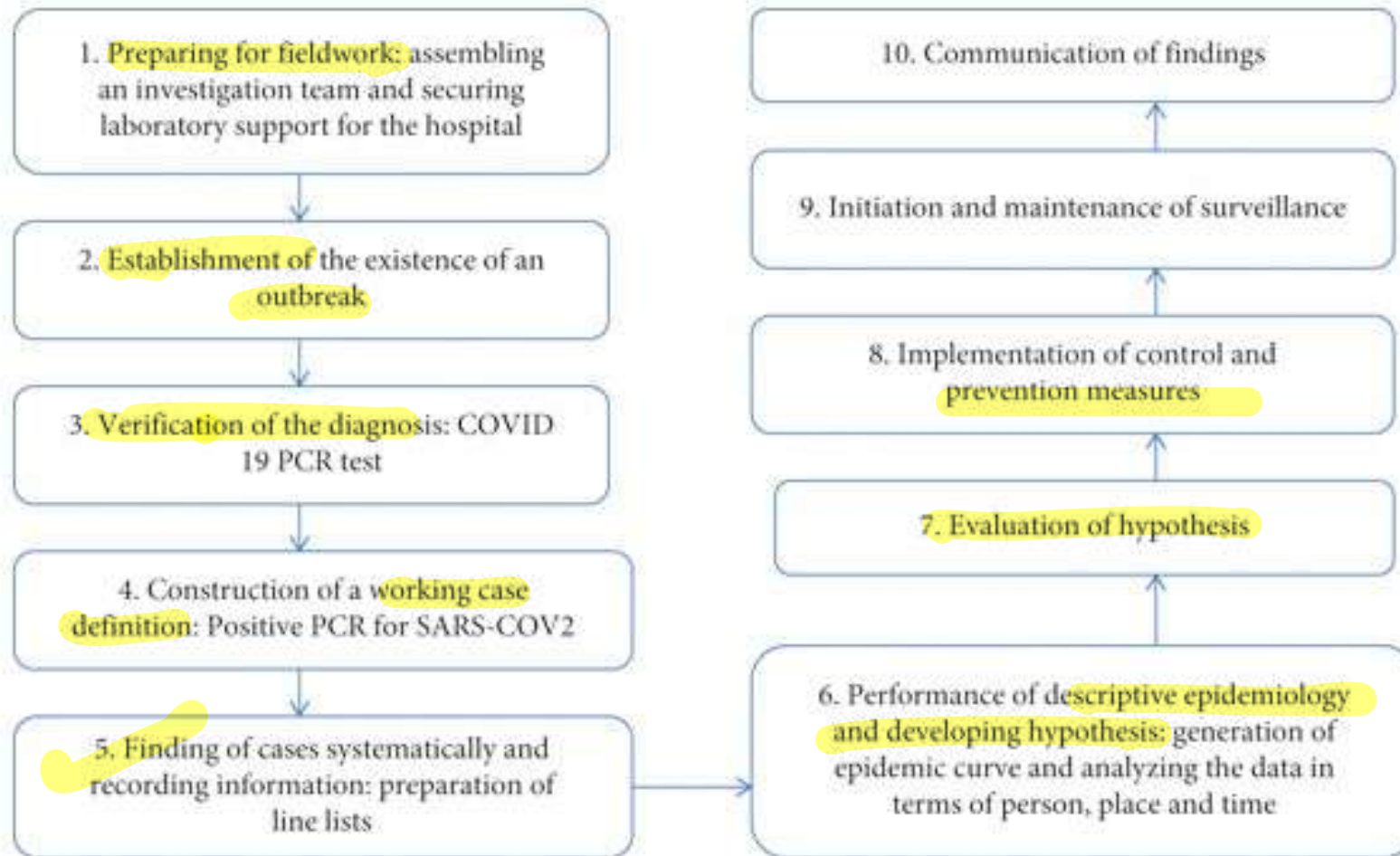
Options;

A) 1 → 3 → 2 → 5 → 4

B) 2 → 5 → 1 → 4 → 3

C) 1 → 2 → 5 → 3 → 4

D) 2 → 1 → 4 → 5 → 3



42. Arrange the following steps of an interview in the correct order in a sequence.

1. Starting an interview
2. Encouragement
3. Establishing contact
4. Securing rapport



Options;

A) 1-2-3-4

B) 3-4-1-2

~~C) 3-1-4-2~~

D) 2-3-4-1

## **Technique of interview**

- 1. ESTABLISHING CONTACT**
- 2. STARTING AN INTERVIEW**
- 3. SECURING RAPPORT**
- 4. RECALL**
- 5. PROBE QUESTIONS**
- 6. ENCOURAGEMENT**
- 7. GUIDING THE INTERVIEW**
- 8. RECORDING**
- 9. CLOSING THE INTERVIEW**
- 10. REPORT**

## 22. Any of the following should be considered as evidence of an outbreak of polio except:

- A) Detection of VDPV in a case of Acute Flaccid Paralysis *Polio event*
- B) Detection of a single case of wild polio in a person with Acute Flaccid Paralysis
- C) Detection of any cVDPV infected individuals
- D) Detection of wild PV infection in a healthy asymptomatic individual



r VDPV

AFP

4-30d of  
DPV

—

c VDPV

1

4-75d of  
DPV

deficit →  
residual  
weakness

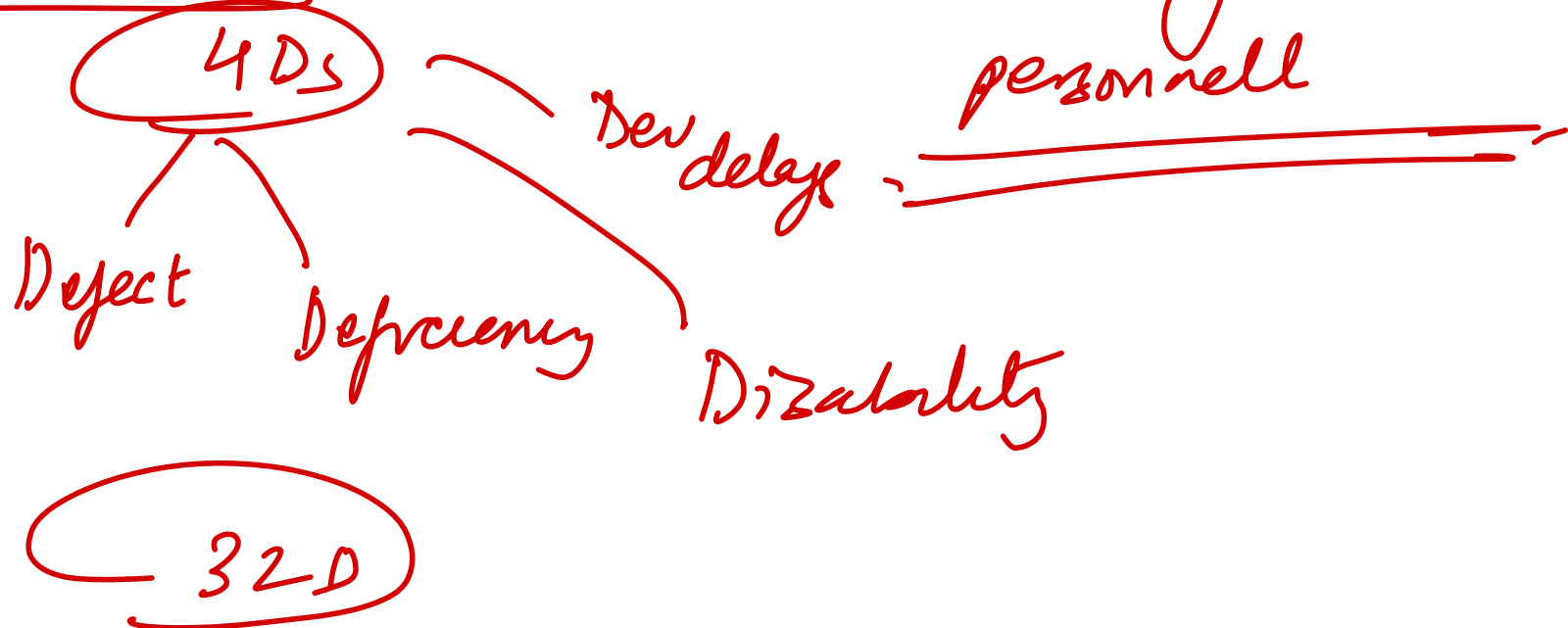
60d

OPV → MC : P2

OPV  
Switch.

25. Which health program in India would provide financial aid to BPL families to help manage a child with major life-threatening diseases?

- A) Rashtriya Arogya Nidhi *upto 15 lakh*
- B) Pradhan Mantri Swasthya Suraksha Yojana *→ p. ATIMS build*
- C) Navjaat Shishu Suraksha Karyakram *NSSK*
- D) Rashtriya Bal Swasthya Karyakram *→ framing health personell*



# GOBI-FFF

- UNICEF

- G-Growth monitoring ✓
- O-Oral rehydration ✓
- B-Breast feeding ✓
- I-Immunization ✓
- F-Family planning ✓
- F-Food supplements ✓
- F-Female education ✓

Vandemataram scheme → Pvt - logo - depot - ORS/ANC IFa  
Kilkari - ANC - phone calls - reminders

Mission Parivarik Vikas - Contraceptive

RAJIV GANDHI SHRAMIK KALYAN YOJNA: contributed under the scheme for two or more years, is entitled to claim unemployment allowance equal to 50% of wage for a maximum period of up to two years during the lifetime.

## 27. Identify the correct statements?

1. Procaine will not dose readjustment in a case of liver failure
2. Meta-zoonoses are transmitted biologically by invertebrate vectors T
3. Gueldels airway is measured from tip of nose to angle of mandible
4. Dextran 40 is the best colloid for microvascular expansion

Options;

- A) 1, 2, 3, 4
- B) 1, 2, 4
- C) 3, 4
- D) 1, 3, 4

Category	Mode	Example
Direct zoonoses	Direct contact/fomite/mechanical vector	Rabies, Trichinosis, Brucellosis
Cyclozoonoses <i>H. Cycle</i>	<u>More than one vertebrate host is needed to complete the developmental cycle.</u>	Human taeniasis, <u>Echinococcosis</u>
Metazoonoses	Transmitted by <u>invertebrate</u> vectors-develops / multiplies	Arboviral infections, <sup>mosquito</sup> Plague, <sup>flea</sup> Schistosomiasis
Saprozoonoses	Has both a vertebrate host and a <u>non-animal</u> (food, soil, plants) developmental reservoir.	Various forms of <u>larva migrans</u> and mycoses

## Types of Transmission in Vectors

### 1. Propagative

- only multiplies in the vector and there is no change in form.

- Example: Plague bacilli in rat fleas.

### 2. Cyclo-propagative

- The agent changes in both form and number.

- Example: Malarial parasites in mosquitoes.

### 3. Cyclo-developmental

- The agent undergoes only developmental changes and not multiplication.

- Example: Microfilaria in mosquitoes. *Q/*

### 4. Transovarial

- Infectious agent is transmitted vertically in the vector, from parent to progeny.

- Example: Rickettsia rickettsii in ticks. *Sign type / mite*

### 5. Transstadial

- The infectious agent stays with the vector from one stage of its life cycle to the next.

- Example: Borrelia burgdorferi in ticks.

Anthropozoonoses: Rabies, plague, hydatid

Zooanthroponoses: TB to cattle

Amphixenosis: T.cruzi, S.japonicum

# 31. What is the use of the following instrument?

A) Humidity of air

*wet - dry bulb*

B) Mean radiant temperature

*→ Globe*

C) Cooling power of air

*Kata*

*low air vel*

D) Maximum temperature reached

*Six's max-min temp*

*slightly*



### 34. Identify the correct statements?

- 1. Rabies is an example of amphixenosis (F)
- 2. A disease whose pathogenic response is higher in children compared in adults is defined as hyperendemic disease *Holo endemic*
- 3. Aeration tank is the heart of the activated sludge process
- 4. Multiple tube method is done for detecting the presence of coliform organisms in a sample of water

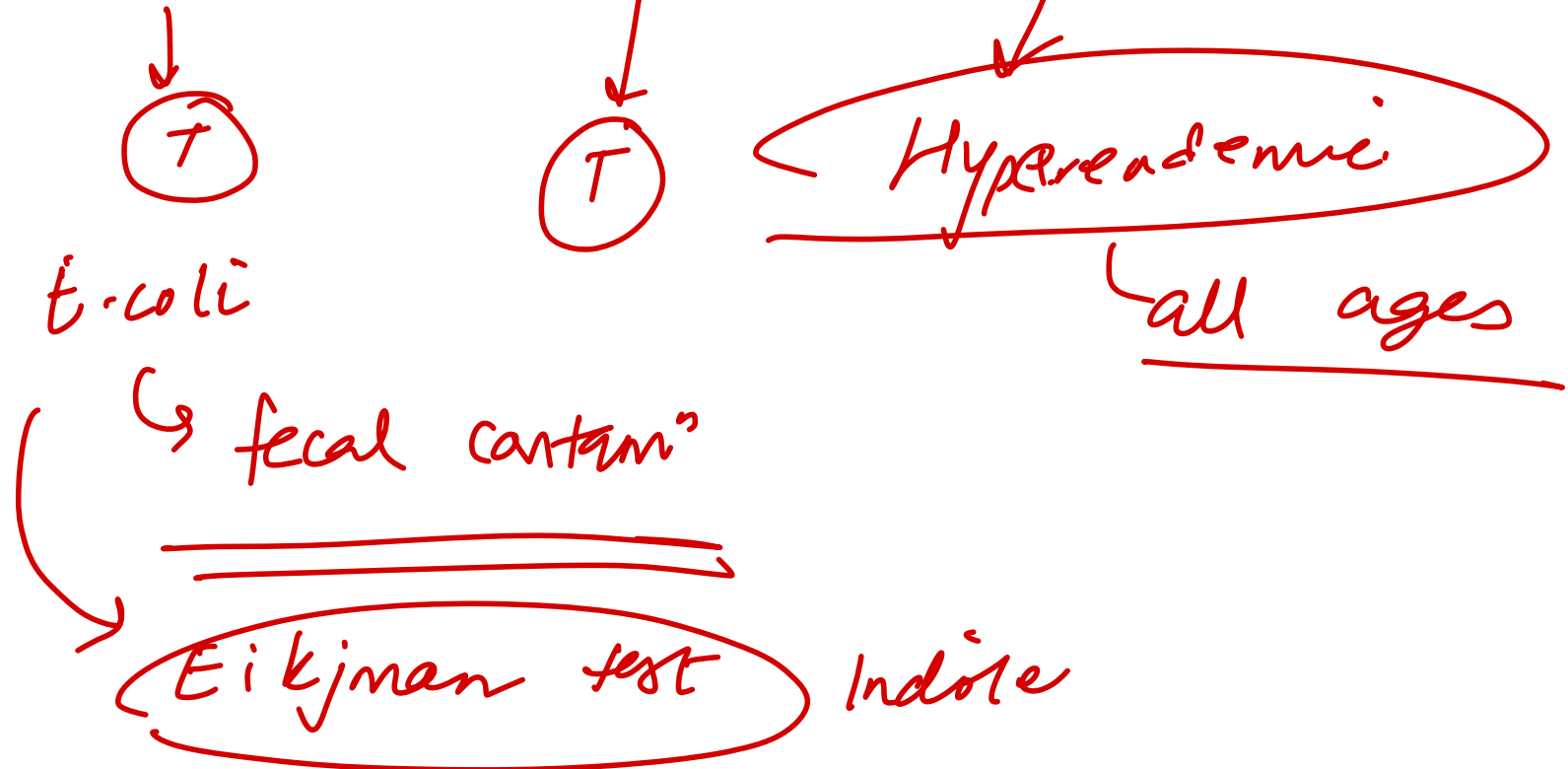
Options;

A) 1, 2, 3, 4

B) 1, 2

~~C) 3, 4~~

D) 1, 3, 4



39. Which of the following is not an organophosphate insecticide?

A) DDT

B) Fenthion ✓

C) Malathion ✓

D) Diazinon ✓

## I. CONTACT POISONS

### 1. Natural:

- Pyrethrum-No residual
- Rotenone
- Derris
- Nicotine
- Mineral oils

### 2. Synthetic

#### A. Organo-chlorine Compounds:

- DDT-Least toxic-Residual 18mon
- Methoxychlor
- HCH (BHC)
- Lindane
- Chlordane
- Heptachlor
- Dieldrin
- Aldrin
- Toxaphene
- Kepone
- Mirex

#### RED B. Organo-phosphorus Insecticides:

- Chlorthion
- Diazinon
- Dioxathion
- Demethoate
- Malathion (OMS-1)-Least toxic
- Fenthion (OMS-2)
- Methyl parathion
- Parathion
- Ronnel
- Trichlorfon
- Dichlorvos
- Abate (OMS-786)
- Naled
- Gardona
- Chlorpyrifos
- Fenitrothion (OMS-43)
- Dicapthon (OMS-214)

#### C. Carbamates:

- Carbaryl
- Dimetilan
- Pyrolan
- Propoxur (OMS-33)

#### D. Synthetic Pyrethroids:

- Resmethrin
- Bioresmethrin
- Pothrin

## II. STOMACH POISONS

- Paris green Q/
- Sodium fluoride

## III. FUMIGANTS

- Hydrogen cyanide
- Methyl bromide
- Sulphur dioxide
- Carbon disulphide

## IV. REPELLENTS

- Meta-diethyltoluamide
- Benzyl benzoate DEET
- Indalone
- Dimethyl phthalate
- Ethyl hexanediol

# INTEGRATED VECTOR CONTROL

QQ

## ANTI-LARVAL MEASURES

URBAN

### Chemical:

Paris green = Stomach poison

Temephos/Abate = Contact poison

Biological: Gambusia / Guppy  
Bacillus thuringiensis

Environmental control *most eff.*

## ANTI-ADULT MEASURES

RURAL

Space spray: LOW API

✓ Malathion

✓ Cyphenothrin

✓ Pyrethrum

Residual spray: HIGH API

DDT (2 rounds)

Malathion (3 rounds)

Deltamethrin (2 rounds)

## PERSONAL PROTECTION

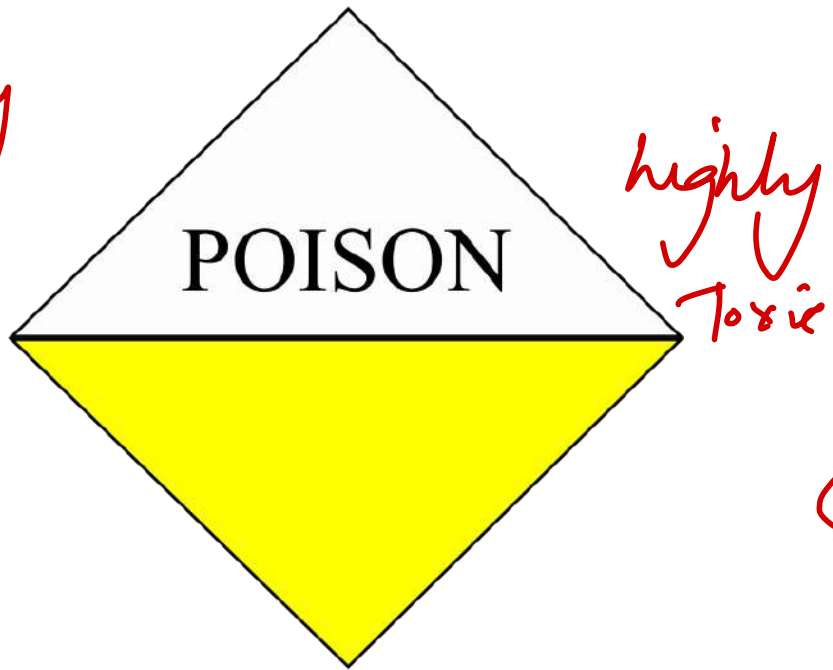
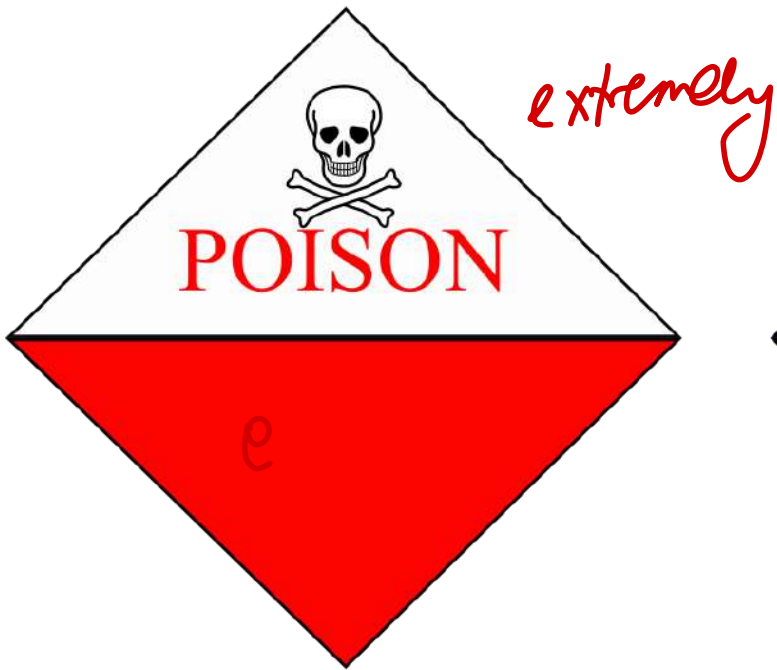
Deltamethrin

-ITBN: 6mon

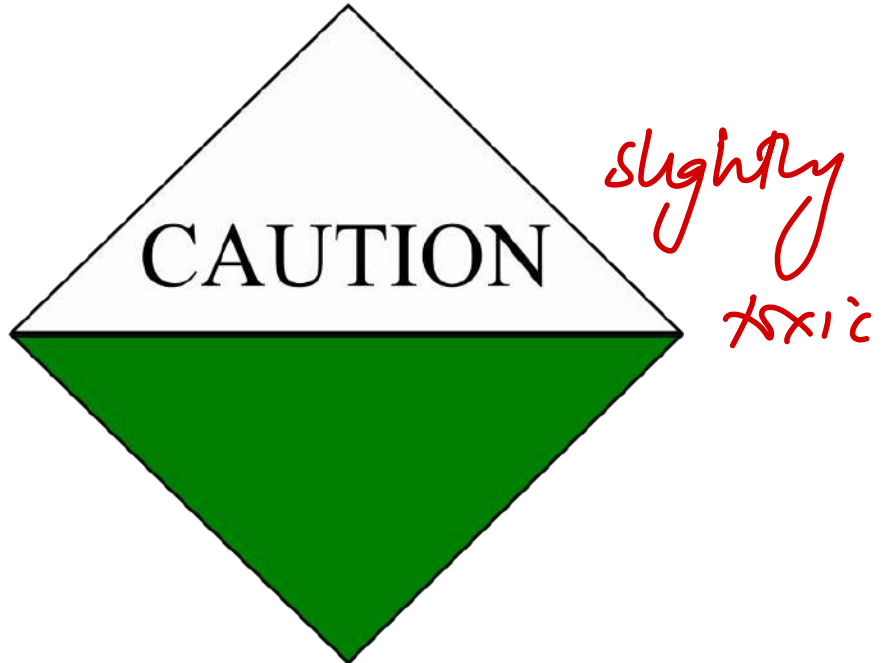
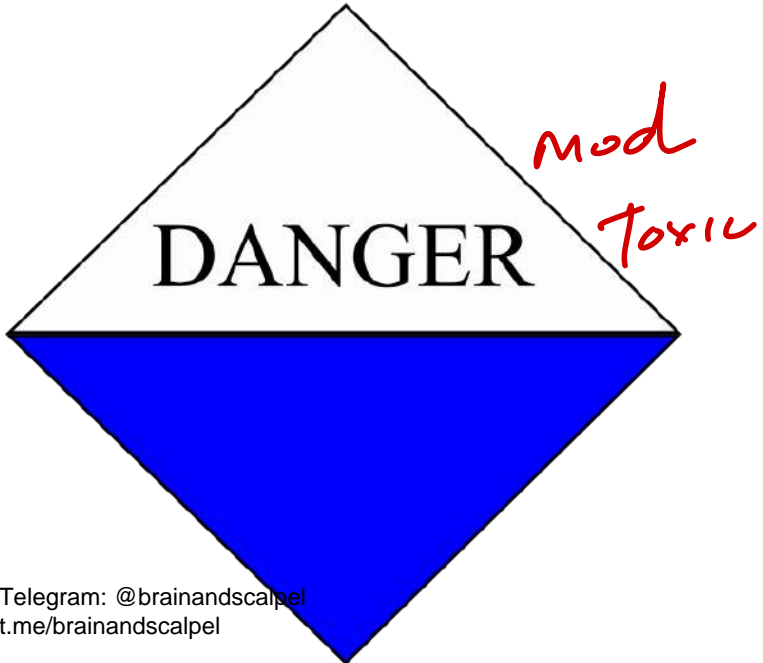
-LLIN: 3yrs *API > 5*

0.0475inch

>150 holes/ich



Insecticides



# 41. Identify the correct statement:

~~A)~~ The states with API <1 and all their districts reporting API <1 are in the elimination phase

~~B)~~ ~~NPU~~ is the best for protein quality → DIAS

C) Standardisation is done before comparing the mortality rates of two countries due to difference in ~~number~~ of deaths age grp

D) Perflation ventilation is a type of mechanical ventilation

F

SMR

↘ natural  
↳ window open

↓  
age specific mortality

## Mechanical Ventilation:

- Exhaust ventilation → *remove stale air*
- Plenum ventilation → *forceful blowing air*
- Balanced ventilation. *Exhaust + Plenum*
- Air conditioning

Category	Criteria
Category 0	States/UTs with zero indigenous cases
Category 1	Elimination phase – States/UTs with $API < 1$
Category 2	Pre-elimination phase – States/UTs with $API < 1$ but some districts reporting $API \geq 1$
Category 3	Intensified control phase – States/UTs with $API \geq 1$

16. A 2 month old child comes to the OPD with complaints of fever, pain and fluctuant swelling at the Left upper limb where he recently received a vaccine. Which of the following steps should be done in the treatment of this child?

- A) Incision and drainage
- B) Conservative Management
- C) Systemic INH therapy
- D) First line ATT

Abscess      BCG

↑

- HHE: DPT

CI? No

Encephalopathy: DPT whole pertussis xx

CI? DT / DaPT

Disseminated BCG infection/ Osteomyelitis: 1-12mon, M.bovis

Injection site abscess: IBD

LN swelling:

incurable  
by

-DPT

Not a CT

DPT /

DaPT

BCG

Local ATT

R<sub>0</sub> - ATT

19. A physician is assessing the body composition of patients using various anthropometric indices. Which of the following indices can he measure without height?

A) Quetelet index = BMI  $\text{kg/m}^2$

B) Broca index  $\text{Wt} = \text{Ht} - 100$

C) Ponderal's index  $-\text{g/cm}^3$

D) Corpulence index

### 1. Body Mass Index (BMI)= Quetelet index

$$\text{BMI} = \text{Weight (kg)} / [\text{Height (m)}]^2$$

### 2. Ponderal Index

$$\text{PI} = \text{Height (cm)} / (\text{Cube root of Body Weight (kg)})$$

*9/cm<sup>3</sup>*

### 3. Brocca Index

$$\text{Ideal Weight} = \text{Height (cm)} - 100$$

### 4. Lorentz's Formula

For Men:

$$\text{Ideal Weight} = \text{Height (cm)} - 100 - (\text{Height (cm)} - 150)/4$$

For Women:

$$\text{Ideal Weight} = \text{Height (cm)} - 100 - (\text{Height (cm)} - 150)/2$$

### 5. Corpulence Index

$$\text{CI} = \text{Actual Weight} / \text{Desirable Weight}$$

*- Ht not needed.*

Should not exceed 1.2

6. Skin fold thickness: Mid triceps/ Biceps/ subscapular/ suprailiac

Sum <40mm males/50mm females

15. Which of the following should be administered to the newborn born to a mother found to have HBsAg positive at labour?

A) Hepatitis B vaccine + Immunoglobulin

B) HBIG

C) Hepatitis B vaccine only

D) Immunoglobulin, followed by vaccine at 6 weeks

Ig + VACCINE

• Hep B-Needle-prick/ Newborns of Hep B mothers

• Tetanus

• Rabies *cat III* *Ig - local*

• Varicella: IC/Newborn *5d before/ 2d after delivery/*Pregnancy:

• Measles: IC/ Infants exposed <6d ago

Ig

There are currently four types of VVM, chosen to match the heat sensitivity of the vaccine. These four types are VVM2, VVM7, VVM14 and VVM30. The VVM number is the time in days that it takes for the inner square to reach the colour indicating a discard point, if the vial is exposed to a constant temperature of 37°C.

## 8. All of the following apply to health propaganda except

A) Knowledge and skills instilled in the minds

~~B) Reflective behavior is promoted~~

C) Appeals to emotion

D) Process is information centered

Education	Propaganda
Knowledge and skills <u>actively acquired.</u>	Knowledge instilled in the minds of people.
Makes people think for themselves. ✓	Prevents or <u>discourages</u> thinking by ready-made slogans.
Disciplines primitive desires.	Arouses and stimulates primitive desires.
Develops <u>reflective</u> behaviour. Trains people to use judgement before acting.	Develops <u>reflexive</u> behaviour, aims at impulsive actions.
Appeals to <u>reason.</u>	Appeals to <u>emotion.</u>
Develops <u>individuality</u> , <u>personality</u> and self-expression.	Develops a standard pattern of attitudes and behaviours according to the mould used.
Knowledge acquired through <u>self-reliant</u> activity.	Knowledge is <u>spoon-fed</u> and <u>passively received.</u>
The process is <u>behaviour-centred</u> – aims at developing favourable attitudes, habits and skills.	The process is <u>information-centred</u> – no change of attitude or behaviour designed.

# 14. Which of the following is not a vital statistic?

- A) Birth rate
- B) Fertility rate
- C) Dependency ratio
- D) Life expectancy at birth

*Popul<sup>n</sup> statistic*

**Vital Statistics include:**

- Birth rate
- Death rate
- Natural growth rate
- Life expectancy at birth
- Mortality rate
- Fertility rate

### 3. RDA of calcium for pregnant and breastfeeding mothers are, respectively:

A) 1000 mg and 1000 mg

B) 1000 mg and 1200 mg

C) 1200 mg and 1200 mg

D) 1200 mg and 1000 mg

Summary of RDA for Indians – 2020

Age Group	Category of work	Body Wt (kg)	Protein (g/d)	Dietary Fibre* (g/d)	Calcium (mg/d)	Magnesium (mg/d)	Iron (mg/d)	Zinc (mg/d)	Iodine (µg/day)	Thiamine (mg/d)	Riboflavin (mg/d)	Niacin (mg/d)	Vit B6 (mg/d)	Folate (µg/d)	Vit B12 (µg/d)	Vit C (mg/d)	Vit A (µg/d)	Vit D (IU/d)
Men	Sedentary	65	54.0	32	1000	440	19	17	150	1.4	2.0	14	1.9	300	2.2	80	1000	600
	Moderate			41						1.8	2.5	18	2.4					
	Heavy			52						2.3	3.2	23	3.1					
Women	Sedentary	55	46.0	25	1000	370	29	13	150	1.4	1.9	11	1.9	220	2.2	65	840	600
	Moderate			32						1.7	2.4	14	1.9					
	Heavy			41						2.2	3.1	18	2.4					
	Pregnant woman	55 + 10	+9.5 (2nd trimester) +22.0 (3rd trimester)	-	1000	440	27	14.5	250	2.0	2.7	+2.5	2.3	570	+0.25	+15	900	600
	Lactation 0-6m		+17.0	-	1200	400	23	14	280	2.1	3.0	+5	+0.26	330	+1.0	+50	950	600
7-12m		+13.0	-						2.1	2.9	+5	+0.17	330					
Infants	0-6 m*	5.8	8.0	-	300	30	-	-	100	0.2	0.4	2	0.1	25	1.2	20	350	400
	6-12m	8.5	10.5	-	300	75	3	2.5	130	0.4	0.6	5	0.6	85	1.2	30	350	400
Children	1-3 y	12.9	12.5	15	500	90	8	3.3	90	0.7	1.1	7	0.9	120	1.2	30	390	
	4-6 y	18.3	16.0	20	550	125	11	4.5	120	0.9	1.3	9	1.2	135	1.2	35	510	600
	7-9 y	25.3	23.0	26	650	175	15	5.9	120	1.1	1.6	11	1.5	170	2.2	45	630	
Boys	10-12 y	34.9	32.0	33	850	240	16	8.5	150	1.5	2.1	15	2.0	220	2.2	55	770	600
Girls	10-12 y	36.4	33.0	31	850	250	28	8.5	150	1.4	1.9	14	1.9	225	2.2	50	790	600
Boys	13-15 y	50.5	45.0	43	1000	345	22	14.3	150	1.9	2.7	19	2.6	285	2.2	70	930	600
Girls	13-15 y	49.6	43.0	36	1000	340	30	12.8	150	1.6	2.2	16	2.2	245	2.2	65	890	600
Boys	16-18 y	64.4	55.0	50	1050	440	26	17.6	150	2.2	3.1	22	3.0	340	2.2	85	1000	600
Girls	16-18 y	55.7	46.0	38	1050	380	32	14.2	150	1.7	2.3	17	2.3	270	2.2	70	860	600

\* Telegram: @brainandscalpel  
 Adequate Intake (AI)  
 t.me/brainandscalpel

4. According to NUHM, arrange the following in the correct order as per population covered from highest level to lowest.

1. Urban Primary Health Centre

2. Urban Community Health Centre

3. Auxiliary Nurse Midwife

4. Urban Social Health Activist

5. Mahila Arogya Samiti



A) 3, 1, 2, 4, 5

B) 1, 2, 3, 4, 5

C) 5, 4, 3, 1, 2

D) 2, 1, 3, 4, 5

For every 2.5 lakh population (5 lakh for metros)

**U-CHC**  
In-patient facility, 30-50 bedded (100 bedded in metros).  
Only for cities with a population of above 5 lakhs.

For every 50,000 population

**U-PHC**

MO I/C	- 1
2nd MO (part time)	- 1
Nurse	- 3
LHV	- 1
Pharmacist	- 1
ANMs	- 3-5
Public Health Manager/ Mobilization Officer	- 1
Support Staff	- 3
M & E Unit	- 1

For every 10,000 population

1 ANM ✓  
Outreach sessions in area of every ANM on weekly basis.

200-500 HHs (1000-2500 population)

Community Health Volunteer (ASHA/LW)

50-100 HHs (250-500 population)

Mahila Arogya Samiti

# Which of the following is true about hot fermentation method?

a) It is an aerobic ~~process~~

*anaerobic*

b) The trenches are of depth 2 meters

*90cm*

~~c) It is also known as Bangalore method~~


d) Decomposition is complete in ~~1 month~~

*3-6 mms*

*sewage disposal.*

Most satisfactory method for refuse disposal:

*sanitary landfill / cont tipping*

 Feature	<b>Rapid Sand Filter (RSF)</b>	<b>Slow Sand Filter (SSF)</b>	Memory Trick
<b>Space</b>	Very little space	Large area	<b>R → Room-saving</b>
<b>Rate of filtration</b>	200 m.g.a.d (Fast)	2–3 m.g.a.d (Slow)	<b>R → Rapid, S → Slow</b>
<b>Sand size</b>	0.4–0.7 mm (Coarser)	0.2–0.3 mm (Finer)	<b>R → Rougher sand</b>
<b>Pre-treatment</b>	Chemical coagulation	Plain sedimentation	<b>R → Requires chemicals</b>
<b>Washing</b>	<b>Back-washing</b>	Scraping	<b>R → Reversible wash (backwash)</b>
<b>Skill</b>	Highly skilled	Less skilled	<b>R → Requires experts</b>
<b>Loss of head</b>	6–8 ft	4 ft	-
<b>Turbidity removal</b>	Good	Good	-
<b>Colour removal</b>	Good	Fair	-
<b>Bacteria removal</b>	98–99%	<b>99.9–99.99%</b>	<b>S → Superior Safety</b>

Cause of death*		Time interval between onset and death
1	Report disease or condition directly leading to death on line a	
	Report chain of events i due to order (if applicable)	
	State the underlying cause on the lowest used line	
a	Direct cause of death Cerebral haemorrhage	4 hours
b	Due to Metastasis of the brain	4 months
c	Due to Breast cancer	5 years
d	Due to	
2	Arterial hypertension (3 years); Diabetes mellitus (10 years)	
	Other significant conditions contributing to death (time intervals can be included in brackets after the condition)	
	*This does not mean the mode of dying. e.g. heart failure, respiratory failure. It means the disease, injury, or complication that caused death.	

Impairment - loss hand  
 Disability inability to write  
 Handicap educ<sup>n</sup> x x

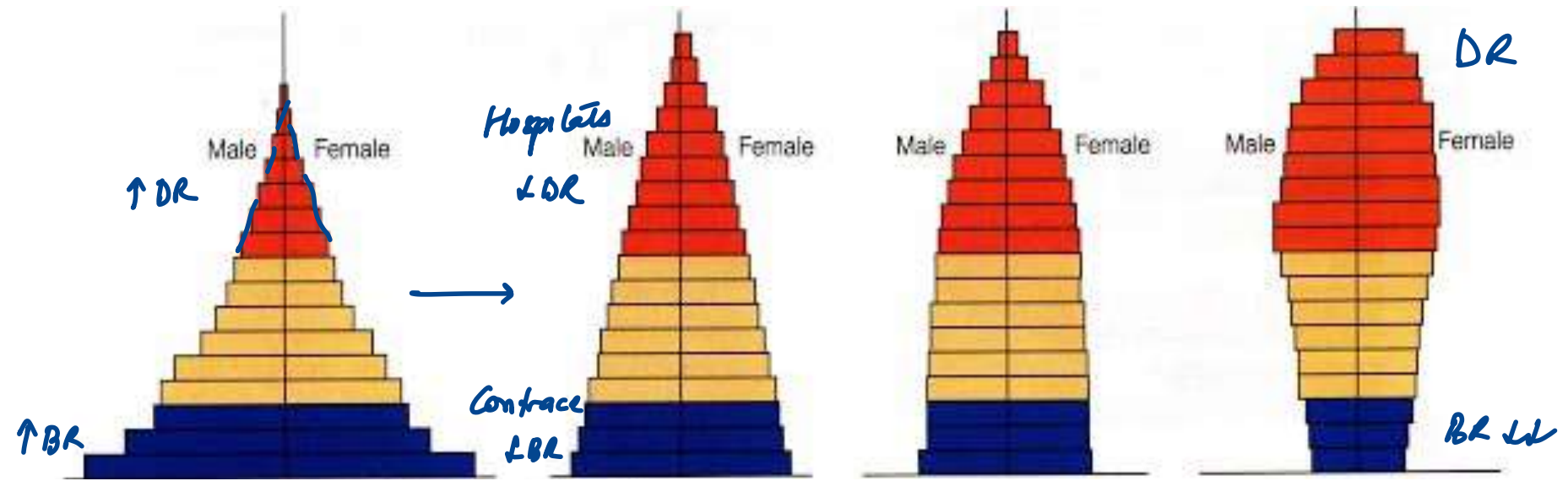
Most dangerous particles: 0.5 - 3 μ

Disease	Duration of Isolation	Communicable periods
Chickenpox / Herpes zoster	6 days after onset of rash / until lesions are crusted	1–2 days before to 4–5 days after appearance of rash
Measles	From onset of catarrhal stage to 5 days after rash onset	4 days before to 5 days after appearance of rash
Diphtheria	Until 48 hours after starting antibiotics	Up to 4 weeks after disease onset
Influenza	3 days after onset	1–2 days before and 1–2 days after onset of symptoms
Mumps	Until swelling subsides	4–6 days before to 7 days after symptoms onset
Pertussis	4 weeks or until paroxysms cease	7 days before to 3 weeks after onset of paroxysms
Meningococcal meningitis	Until 24 hours after starting antibiotics	Till meningococci are absent from nasal/throat swabs
Cholera	3 days after starting tetracyclines	
Shigellosis, Salmonellosis	Until 3 consecutive negative stool cultures	
Hepatitis A	3 weeks	

Stage	Key Words
1. Awareness	Interest
2. Motivation	Evaluation, Decision-making
3. Action	Adoption / Acceptance

Category	Comments
<i>Water-borne diseases</i>	Caused by the ingestion of water contaminated by human or animal feces or urine containing pathogenic bacteria or viruses; includes cholera, typhoid, amoebic and bacillary dysentery and other diarrhoeal diseases.
<i>Water-washed diseases</i>	Caused by poor personal hygiene; includes scabies, trachoma and flea-, lice-, and tick-borne diseases, which are also water-washed.
<i>Water-based diseases</i> <u>Cyclops</u>	Caused by parasites found in intermediate organisms living in water; includes dracunculiasis, schistosomiasis and some other helminths.
<i>Water-related diseases</i> <u>vector</u>	Transmitted by <u>insect vectors</u> which breed in water; includes dengue, filariasis, malaria, onchocerciasis, trypanosomiasis and yellow fever.

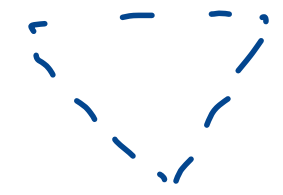
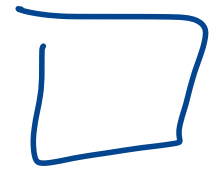
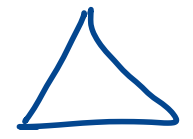
# Population pyramids



developing

early developed

late developed



expanding

→ stationary

→ contracting

# DERMA

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# 13. Which of the following are included in malpighian layer of the epidermis?

- A) Stratum corneum and stratum granulosum
- B) Stratum granulosum and stratum spinosum
- C) Stratum granulosum and stratum lucidum
- D) Stratum spinosum and stratum basale

PV - Suprabasal  
Spinous

38. Which of the following histopathological findings is characteristic of acute eczema?

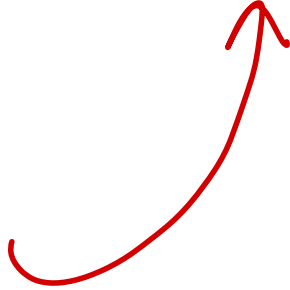
A) Parakeratosis

*chronic*  
*XX*

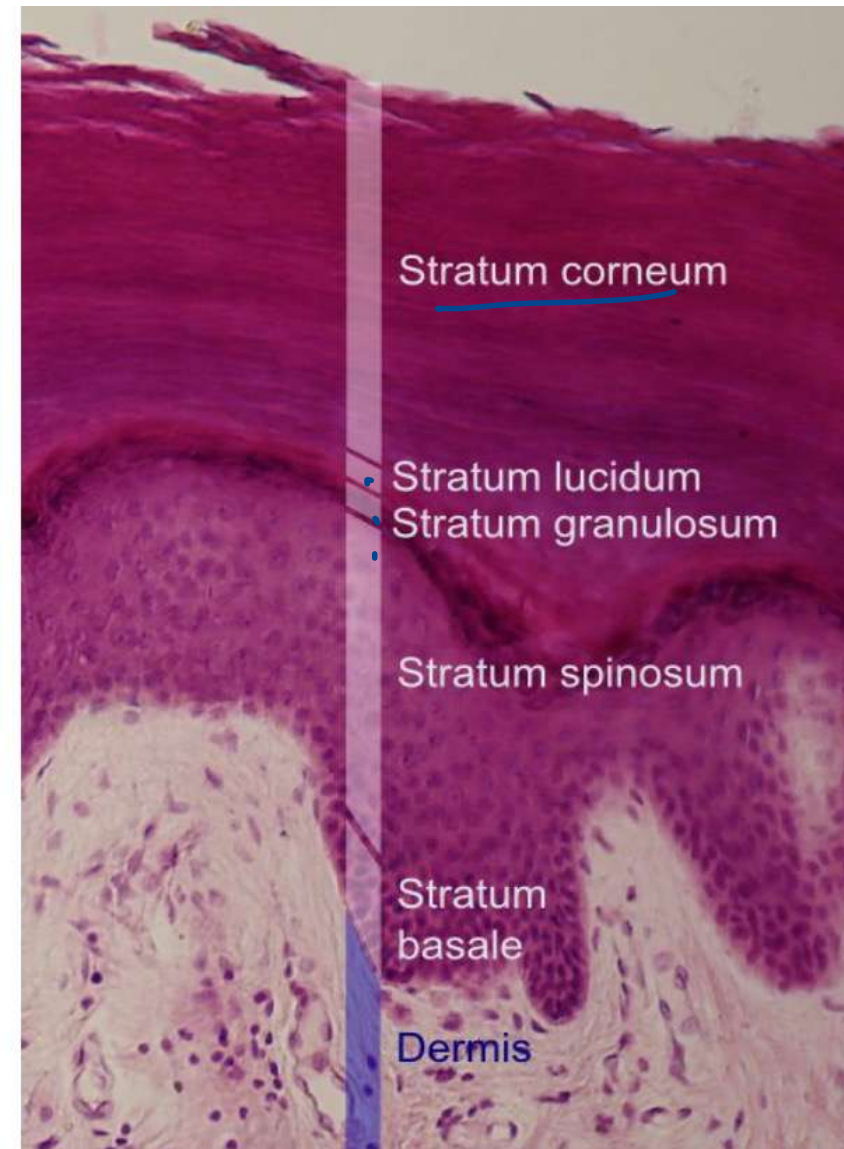
B) Hyperkeratosis

~~C) Intercellular edema~~

D) Intracellular edema



# DERMATO-PATHOLOGY



Hyperkeratosis: Ps, LP / Yernuca / Calluses  
(thickening)

Parakeratosis: PEAS → Ps / eczema / AK / SK / SqCC  
(Nuclei retained)

Orthokeratosis: Hyper- Para  
prealign  
SqCC

Dyskeratosis: AK / SqCC / Darier / Bowen's  
abn premature keratin

Hypergranulosis: LP (Wickham striae)

Spongiosis: intercellular edema - eczema  
(vs intracellular - HSV - ballooning)

Acanthosis: spinous thickening → AN / Psoriasis

Acantholysis: Pemphigus / HSV

Munro's microabscess: Ps

Pautrier's microabscess: Mycoses

Civatte bodies: LP

# SKIN LESIONS

## PRIMARY LESIONS



**Macule**

Flat discoloration  
≤ 1 cm in diameter



**Patch**

Flat discoloration  
> 1 cm in diameter



**Papule**

Elevated, solid  
skin lesion ≤ 1 cm



**Plaque**

Elevated, flat-  
topped lesion  
> 1 cm in diameter

**Nodule**

Firm, deep lesion, > 1 cm

**Tumor**

Large solid mass, deeper in dermis

**Vesicle**

Small fluid-filled blister, ≤ 1 cm

**Bulla**

Large fluid-filled blister, ≥ 1 cm

**Pustule**

Pus-filled vesicle

**Wheal**

*dermal edema - urticaria*

## SECONDARY LESIONS



**Scale**

Thickened stratum corneum



**Lichenification**

Thickened, rough skin with  
accentuated skin markings

**Crust**

Dried serum, blood, or pus

**Erosion**



Loss of part of the epidermis,  
heals without scar

**Ulcer**

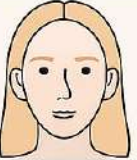







Full-thickness loss of epidermis  
and dermis, heals with scar

**Excoriation**

Linear erosion caused by scratching

# Fitzpatrick Skin Type Classification

TYPE	SKIN COLOR	REACTION TO SUN EXPOSURE	EXAMPLES
I		Very fair, pale	Northern Europeans
II		Usually burns, tans minimally	Northern/Central Europeans
III		Sometimes burns, tans uniformly	Southern Europeans, Middle Eastern
IV		Rarely burns tans easily	Mediterranean Hispanic, some Asians
V		Very rarely burns, tans very easily	Middle Eastern South Asians some African descent
VI		Never burns, tans profusely	Sub-Saharan African Afro-Caribbean

pheo

pseudo  
orange-red.



eumelanin → true brown

Sun burn

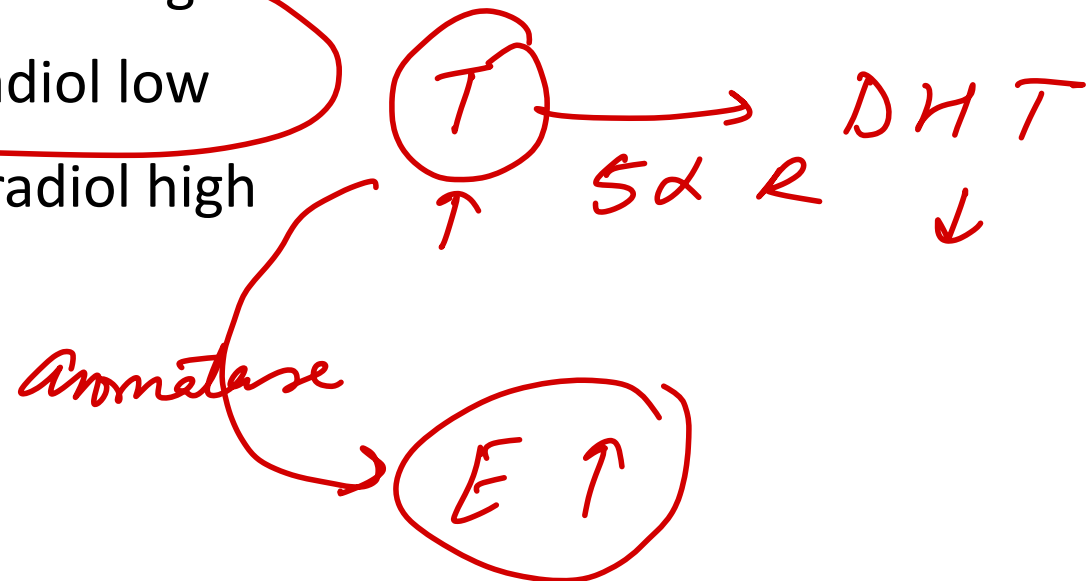
tan

23. A 28-year-old man comes to the OPD to discuss hair loss. He has hair loss primarily around the temples, which began insidiously 3 years ago. Physical examination shows moderate thinning of hair at the anterior scalp, temporal region, and vertex. An oral medication is prescribed to treat the hair loss. After the initiation of therapy, which of the following changes would most likely occur in this patient?

- A) ~~Testosterone low, Dihydrotestosterone low, Estradiol normal~~
- B) Testosterone high, Dihydrotestosterone low, Estradiol high**
- C) Testosterone high, Dihydrotestosterone low, Estradiol low
- D) ~~Testosterone high, Dihydrotestosterone high, Estradiol high~~

AGA

Finasteride



## 29. Which of the following statements is false regarding this condition?

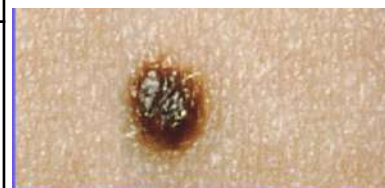
- A) Seen in photoexposed areas (T)
- ~~B) Increased number of melanocytes are seen~~
- C) It is associated with xeroderma pigmentosa (T)
- D) It is caused by increased melanin (T)



↓  
Freckles

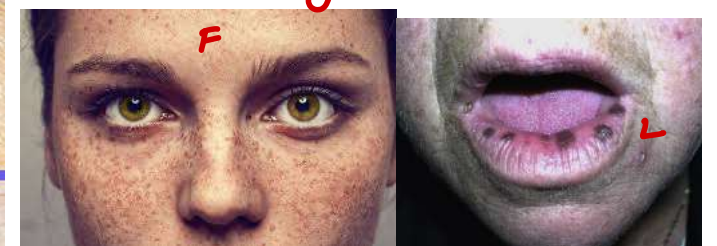
# PIGMENTATION DISORDERS

Type	Clinical Features	Histopathology
<b>Junctional Nevus</b>	Flat, uniformly pigmented macule	Nests of melanocytes at the <u>dermoepidermal junction</u>
<b>Compound Nevus</b>	Slightly elevated papule, uniformly pigmented	Nests of melanocytes at both dermoepidermal junction and dermis
<b>Intradermal Nevus</b>	Dome-shaped papule, <u>flesh-colored</u> or lightly pigmented	Melanocytes entirely within the dermis
<b>Congenital Melanocytic Nevus (CMN)</b> <i>Giant: &gt;20cm</i>	Present at birth, may have hair, large variants have malignancy risk <i>hair ++</i>	Melanocytes in dermis, sometimes deep into subcutaneous fat or around adnexa <i>↑ melanoma</i>
<b>Halo Nevus</b>	Central pigmented nevus with surrounding depigmented halo	Lymphocytic infiltration around nevus cells
<b>Dysplastic (Atypical) Nevus</b> <small>Telegram: @brainandscalpel t.me/brainandscalpel</small>	Irregular border, color variation, may resemble melanoma	Architectural disorder, cytologic atypia of melanocytes, bridging of rete ridges



**Freckles (Ephelides):** *melanocyte activity ↑*

**Lentigines:** *melanocyte no. (↑).*



*Spitz nevi*  
*(spindles)*

*lymphocyte.*

35. A 29-year-old man is evaluated for a skin rash involving his hands, feet, and scalp for the last 2 weeks. The rash is mildly pruritic and has progressively worsened. The patient has a history of HIV and is not adherent with antiretroviral therapy. Skin examination shows erythematous patches with scales and crusting. Biopsy of the rash as shown below. Which of the following is the most appropriate treatment for this patient?

- A) Systemic acyclovir
- B) Systemic terbinafine
- C) Topical glucocorticoid
- D) Topical permethrin

*Nonwegian*  
*Scabies*  
*millions*  
*Ivermectin*



*10-15 mites*

Treatment	Dosage	Advantages	Disadvantages/contraindications
<u>Sulphur</u>	2–10% precipitate in petroleum base	Safe for infants, pregnant and lactating women; inexpensive	Noxious and malodorous, and may cause skin irritation; multiple treatments required; lack of safety and efficacy data
Crotamiton	10% ointment	Safe for infants; reported antibacterial and antipruritic activity; low toxicity; well tolerated	Clinical efficacy questionable; multiple treatments required; resistance reported
Benzyl benzoate	25% ointment	Effective; inexpensive	Can cause severe skin irritation; contraindicated in pregnant women and infants
<u>Lindane</u>	1% lotion or cream	Effective; inexpensive	Can cause numbness, cramps, dizziness, seizures in children; contraindicated in pregnant women and infants; resistance reported; withdrawn in several countries owing to neurotoxicity concerns
Permethrin	5% cream	Effective; well tolerated; safe	May rarely cause skin irritation; expensive; resistance reported
Ivermectin	Oral, 200 µg/kg	Broad-spectrum antiparasitic; convenient; few side effects	Contraindicated in pregnant women and infants (owing to current lack of safety data); optimal dose regimen uncertain; expensive; resistance reported

36. All of the following result in an exacerbation of acne, except:

A) Carbamazepine

AED

~~B) Azelaic acid~~

C) Topical steroids

✓✓

dermal atrophy

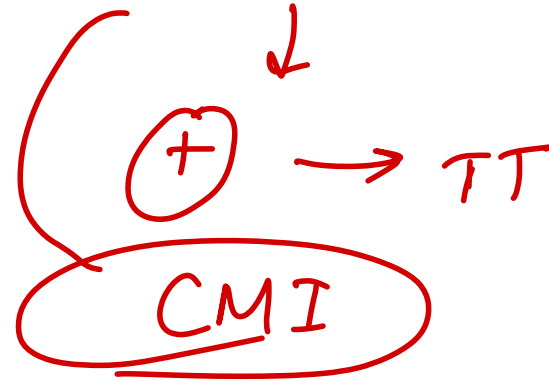
D) Danazol

E) Lithium

F) vit B12

12. The Fernandez reaction of lepromin test is read at:

- A) 12 hours
- B) 24 hours
- C) 48 hours
- D) 21 days



**1. Fernandez Reaction** (early reaction):

1. **Type IV hypersensitivity reaction**

2. **Read at 48 hours**

3. Indicates prior sensitization to *M. leprae*

**2. Mitsuda Reaction** (late reaction):

1. Read at **21 days**

2. Indicates long-term cell-mediated immunity and correlates with **tuberculoid leprosy**

7. An 18-month-old boy with a known history of atopic dermatitis is brought to the emergency department with worsening facial rash and fever for 2 days. His parents state that he had an eczema flare recently for which they applied an over-the-counter steroid cream. Shortly after, he developed painful vesicles that spread rapidly over the cheeks. Which of the following is the most likely causative agent?

- ~~A) Herpes simplex virus~~
- B) Methicillin-resistant Staphylococcus aureus
- C) Methicillin-sensitive Staphylococcus aureus
- D) Varicella zoster virus

*eczema herpeticum*



43. Arrange the following corticosteroids in the order of increasing t<sub>1/2</sub> (low to high).

1. Dexamethasone
2. Hydrocortisone
3. Betamethasone
4. Prednisolone

A) 3, ~~4, 1~~, 2

B) 2, 3, 4, 1

C) 2, 3, 1, 4

~~D) 2, 4, 1, 3~~

Category	Drug	Effect of anti-inflammation (ratio)*	Equivalent dose(mg)*	Plasma half-life (min.)	Duration of action(h)
Short-acting	Hydrocortisone	1	20	90	8-12
	Cortisone	0.8	25	30	8-12
Mid-acting	Prednisone	3.5	5	60	12-36
	Prednisolone	4.0	5	200	12-36
	Methylprednisolone	5.0	4	180	12-36
	Triamcinolone	5.0	4	>200	12-36
Long-acting	Dexamethasone	30	0.75	100-300	36-54
	Betamethasone	25-35	0.6	100-300	36-54

44. A 43-year-old man comes to the clinic for evaluation of a healed forehead laceration. On examination, the scar is pink, firm, and mildly raised, without surrounding erythema or edema; it does not extend beyond the initial wound borders. The patient is reassured that the scar should flatten over the following months. The process by which this occurs relies mostly on enhanced cellular production of which of the following?

A) Metalloproteinases

B) Plasminogen activator

C) Reactive oxygen species

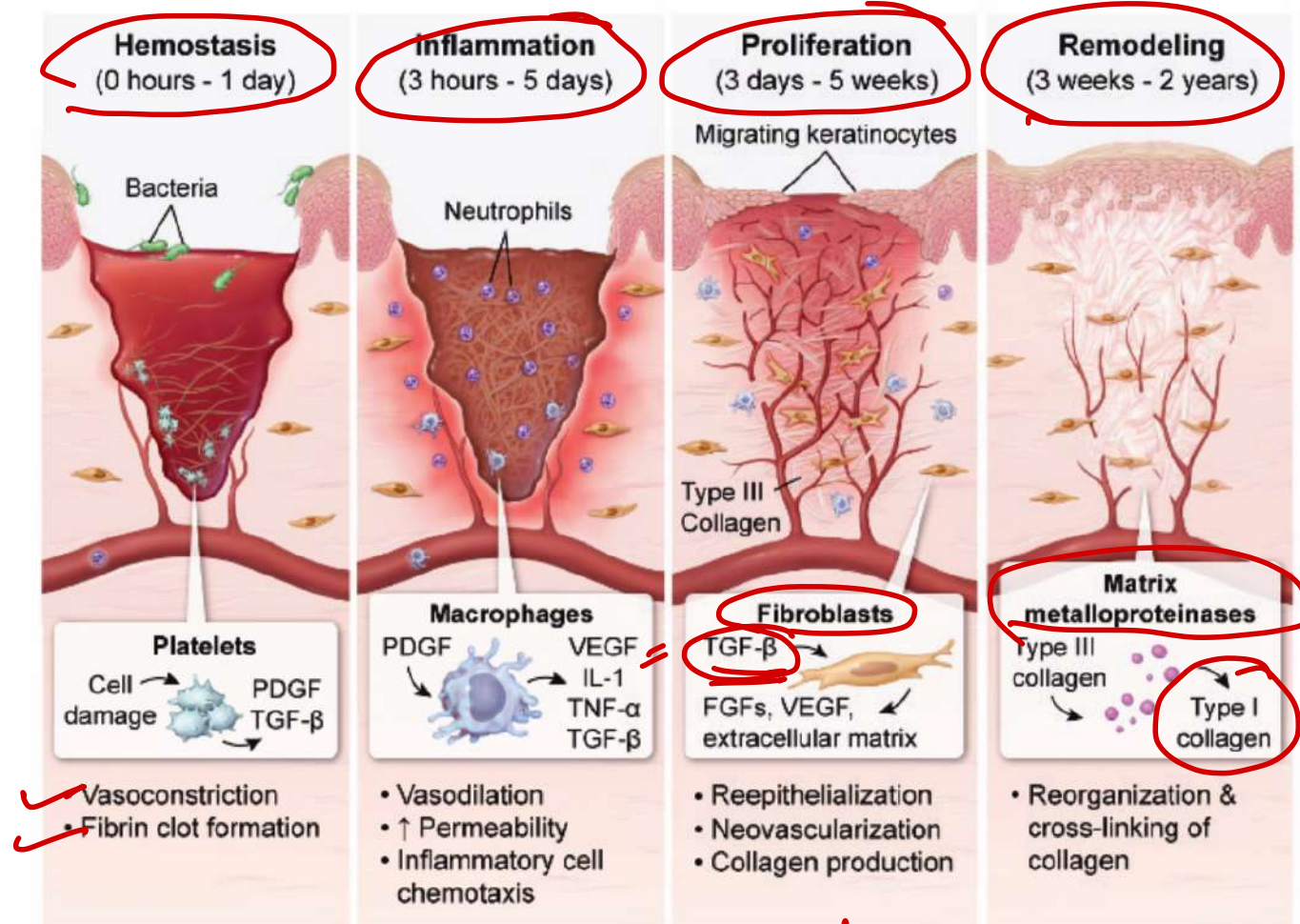
D) Tumor necrosis factor-alpha

→ early

→ inflan

→ inflamm

## Phases of wound healing



MMP

✓ neutrophils  
 ✓ mp ges  
 ↓  
 coll II → coll I

# ANESTHESIA

---

## 9. Identify the defective enzyme in a patient whose dibucaine number was 20.

- A) Acetylcholinesterase
- B) Monoamine oxidase
- C) Catechol-O-methyltransferase
- D) Butyrylcholinesterase

• **Dibucaine** is a local anesthetic that inhibits normal butyrylcholinesterase. The **dibucaine number** reflects how much enzyme activity is inhibited by dibucaine.

A **dibucaine number of <30** indicates a **homozygous abnormal variant** of **butyrylcholinesterase**, leading to **prolonged paralysis** after administration of **succinylcholine** and **mivacurium**

→ ↑ *atypical pseudocholin*

# 1. What is the composition of Amsorb?

*better*

*OA*

~~A)  $\text{Ca(OH)}_2$ ,  $\text{CaCl}_2$ ,  $\text{CaSO}_4$~~

B)  $\text{Ca(OH)}_2$ ,  $\text{NaOH}$ ,  $\text{KOH}$

C)  $\text{Ca(OH)}_2$ ,  $\text{NaOH}$ ,  $\text{CaCl}_2$

D)  $\text{Ba(OH)}_2$ ,  $\text{CaSO}_4$

*soda lime* → *Compound A* → *Sevoflurane*  
↘ *CO* → *Desflurane*

*$\text{Ba(OH)}_2$ ,  $\text{Ca(OH)}_2$  → Barlyme*

# 5. Which of the following peripheral blocks is best for shoulder surgery?

- A) Interscalene block
- B) Infraclavicular block
- C) Axillary block
- D) Supraclavicular block

*- trunk / arm*

*} ÷ / cord → Hand / elbow*

*Hand*

*Interscal → Supraclav → Infraclav*

*↓  
Axillary ✓*

6. What is the size of the endotracheal tube and blade to be used for resuscitation of a preterm neonate with weight 1.8 kg not responding to PPV?

A) Size 0 blade, 3 mm tube

B) Size 1 blade, 2.5 mm tube

C) Size 0 blade, 2 mm tube

D) Size 1 blade, 1.5 mm tube

**SIZE OF LMA**

Child: 3  
Female: 4  
Male: 5

-1

**SIZE OF Laryngoscope**

Preterm-0  
Term-1  
Children-2  
Female-3  
Male-4

**Size of ET tube**

Low-pressure, high-volume cuff  
<1000g baby-2.5mm  
1-2kg baby-3mm  
>2kg-3.5mm  
Child-3-4  
Female:7mm  
Male: 8mm

$$ET = 4 + \frac{age}{4}$$

## Tube Sizes in Pediatric



Types of tubes	Formula	4 Y	Unit
Endotracheal tube (uncuffed)	ETT = 4 + (age/4)	5	mm
NG or OG tube	NG = 2 x ETT	10	French
Foley tube	Foley = 2 x ETT	10	French
ETT depth (from incisor)	Depth = 3 x ETT	15	cm
Chest tube (max size)	Chest tube = 4 x ETT	20	French

Note 1: Minus the ETT size by 0.5 mm if cuffed tubes are used.  
Note 2: Do not use cuffed ETT in neonates.



11. Which of the following cylinders can be used in patients with acute exacerbation of bronchial asthma along with oxygen?

A) Violet

B) Blue - entonox

~~C) Brown~~

D) Orange - cyclopropane

Heliox  
(He + O<sub>2</sub>)

↓ density

↓ bronchospasm

## 20. Post-dural puncture headache depends on all except?

- A) Age / ♀ young ✓
- ~~B) Timing of ambulation~~
- C) Pregnancy pregn ✓
- D) Type of needle - dura splitting (↓)

↑ on standing  
↓ on supine  
↓  
+ - iv fluids  
- caffeine  
autologous blood patch

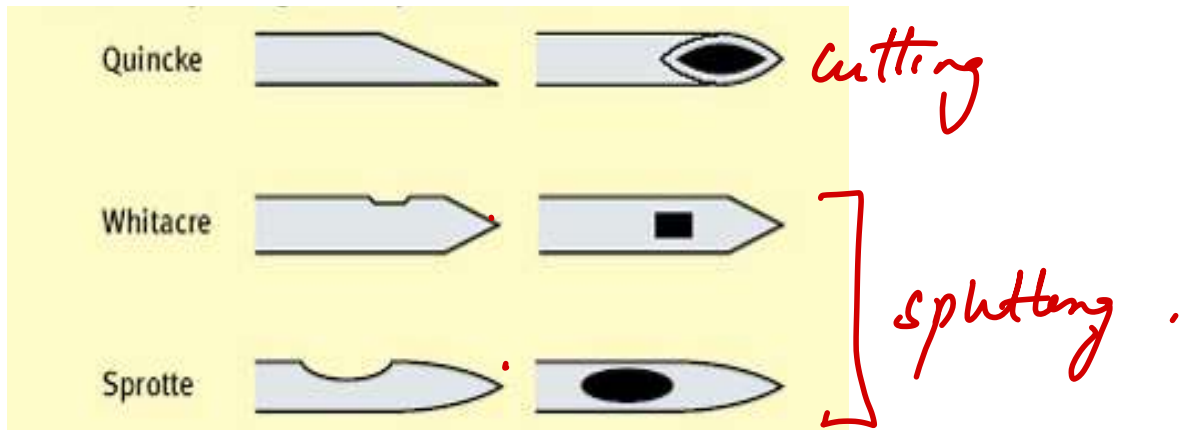
## Factors That Can Increase the Incidence of Headache After Spinal Puncture

- Age
- Sex
- Needle size
- Needle bevel
- Pregnancy
- Dural punctures

young ♀

most comp

no ↑



**21. You are planning to wean a patient off mechanical ventilation. Which of the following is not a criterion to do so?**

A) Tidal volume more than 5 ml/kg

B) Vital capacity more than 5 ml/kg

C) Minute ventilation of less than 10L/min

D) Rapid Shallow Breathing Index (RSBI) < 105

Parameter	Weaning Threshold (Acceptable)
PaO <sub>2</sub> /FiO <sub>2</sub> ratio	> 200
PEEP	≤ 5–8 cm H <sub>2</sub> O
FiO <sub>2</sub>	≤ 40–50%
pH	≥ 7.30
Tidal Volume (VT)	≥ 5 ml/kg
Vital Capacity (VC)	≥ 10–15 ml/kg
Minute Ventilation (VE)	≤ 10 L/min
Respiratory Rate (RR)	< 30 breaths/min
Max Inspiratory Pressure (MIP)	≤ -20 to -30 cm H <sub>2</sub> O
Rapid Shallow Breathing Index (RSBI)	$< 105 (f/V_t)$ f = respiratory rate, V <sub>t</sub> = tidal volume (L)

24. An elderly man with ca pancreas is receiving intravenous opioids for pain management. Which of the following drugs can be safely administered to him because of ceiling effect on respiratory depression?

A) Morphine ✓

B) Buprenorphine ✓

C) Fentanyl ✓

D) Methadone ✓

NAV E L  
Naloxone      Atropine      Vasopressin  
Epi V  
Lignocaine

Drugs given via ET route

Full agonist: Morphine, Pethidine, Heroin, Meperidine, Methadone, Codeine, Fentanyl

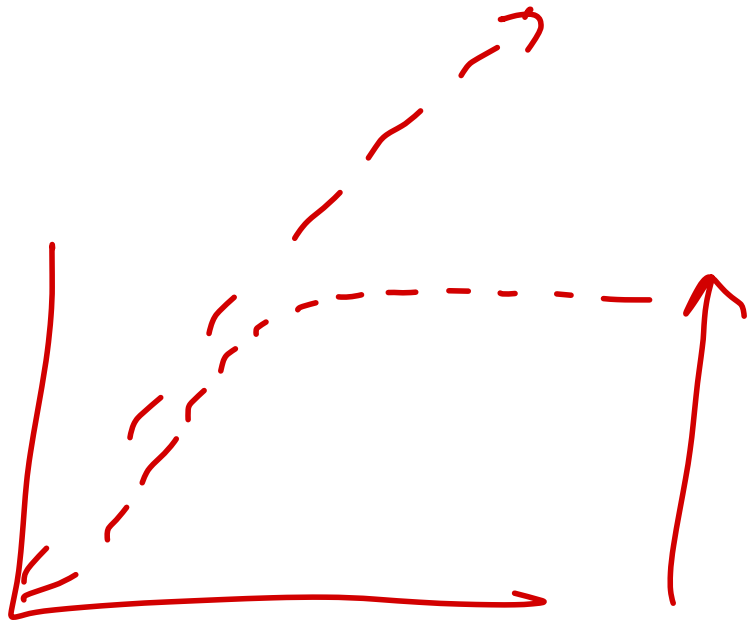
Partial agonist: Buprenorphine

Mixed agonist/antagonist: Nalbuphine, Pentazocine, Butorphanol

Antagonist:

x ceiling

} → ceiling effect



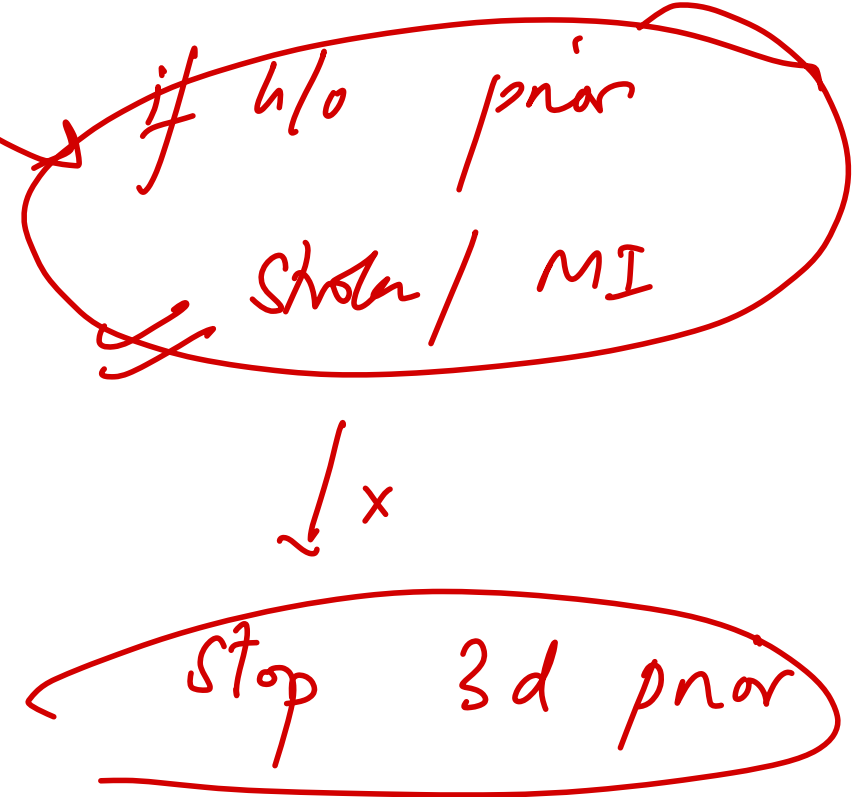
**26. The presence of which structure is responsible for infants to be able to breathe simultaneously while suckling milk?**

- A) Small tongue
- B) Small soft palate
- C) High larynx**
- D) Small pharynx

<b>Feature</b>	<b>Child</b>	<b>Adults</b>
<b>Position</b>	C3–C4	C5–C6
<b>Epiglottis</b>	✓ Omega-shaped	Leaf-shaped
<b>Thyroid cartilage</b>	<u>Flat</u>	Angulated
<b>Larynx</b>	<u>Conical</u>	Cylindrical
<b>Laryngeal cartilages</b>	<u>Soft and collapsible</u>	Hard and ossified

## 28. What would be your advice regarding low-dose aspirin before the procedure?

- A) Continue aspirin
- B) Stop aspirin and replace with heparin
- C) Stop aspirin and give a platelet transfusion
- D) Stop aspirin on morning of surgery



## 37. Which of the following is an advantage of epidural over spinal anesthesia?

- A) Less dose of drug required
- B) Duration can be prolonged using an inlaying catheter
- C) Easier technique
- D) Less traumatic needle

Features	Epidural Anesthesia (EA)	Spinal Anesthesia (SA)
Drug dose	Larger dose	Smaller dose
Onset of anesthesia	Approximately 25–30 minutes	Approximately 5 minutes
Spine level that can be performed	Anywhere along the vertebral column	Lumbar only (mostly below the L2 vertebral body)
Quality of anesthesia	Not as good as SA	High
Intraoperative redosing	Possible, can be continued postoperatively via a catheter	Generally, a single-shot injection
Duration of block	Adjustable, prolonged	Brief, usually 2–4 hours

eclampsia  
↓  
GA

predominant ideal

autonomic > sensory > motor  
↑ r/o - hypotension

Doc for spinal induced ↓ → phenylephrine (α1)

High spinal → T4

♡ → bradyc

Complete spinal  
(brainstem)

↓  
CPR + ventl<sup>n</sup>

48. Which is the preferred anaesthetic technique used in a surgery for a patient with severe aortic stenosis?

~~A) General anesthesia~~

B) Spinal anesthesia

C) Epidural anesthesia

D) Intercostal nerve block

X  
Hypotension

# 50. Identify the correct size and material of MRI compatible gas cylinder

A) Stainless steel, Size E

B) Molybdenum steel, Size A

C) Aluminium, Size E

D) Hard plastic, Size A

*mc*

*mc size* → *E*

## 27. Identify the correct statements?

1. Procaine will not <sup>need</sup> dose readjustment in a case of liver failure (T)
2. Meta-zoonoses are transmitted biologically by invertebrate vectors (T)
3. Gueldels airway is measured from tip of ~~nose~~ to angle of mandible ← (T)  
*∠ of mandible*
4. Dextran 40 is the best colloid for microvascular expansion (T)

Options;

A) 1, 2, 3, 4

~~B) 1, 2, 4~~

C) 3, 4

D) 1, 3, 4

Feature	Amides ("i")	Esters
Structure	Amino-amides	Amino-esters
Examples	Bupivacaine Lidocaine Ropivacaine Prilocaine Mepivacaine Articaine → pseudochol	Cocaine → Liver + <u>Pseudochol</u> Procaine Benzocaine Tetracaine
Volume of Distribution	More	Less (due to metabolism of <u>pseudocholinesterases</u> ) vd ↓
Metabolism	Liver – cytochrome P450	Plasma – pseudocholinesterases
Duration of Action	Longer	Shorter
Allergic Reactions	Rare (*methylparaben preservative)	<u>PABA metabolite</u> (most likely allergic to esters)

# COLLOIDS

Colloid Type	Examples	Main Uses	Key Risks / Notes
<b>Dextran 40</b>	Dextran 40 (MW ~40k)	Microvascular surgery (finger, limb reimplantation)	↓ Platelet aggregation, ↓ viscosity, bleeding risk
<b>Dextran 70</b>	Dextran 70 (MW ~70k)	Plasma expander in hypovolemia	
<b>Hydroxyethyl Starch (HES)</b>	Hetastarch, Pentastarch, Voluven	Volume resuscitation (limited use now)	Coagulopathy, AKI, avoid in sepsis
<b>Gelatin</b>	Gelofusine, Haemaccel	Short-term plasma expansion	High anaphylaxis risk
<b>Albumin (Natural Colloid)</b>	5%, 20% Human Albumin	Hypoalbuminemia, liver failure, burns	Expensive, safe in most

**A 30-year-old construction worker presents to the pain clinic for a procedure involving local anesthetic infiltration for pain management. The physician wants to ensure that the patient receives adequate anesthesia with minimal systemic absorption issues. What is the correct order of routes for the absorption of local anesthetics from fastest to slowest?**

- A. IV, Intercostal, Caudal, epidural, Brachial, subcutaneous
- B. Intercostal, Epidural, Caudal, Brachial
- C. Brachial, Intercostal, Caudal, Epidural
- D. Caudal, Brachial, Intercostal, Epidural