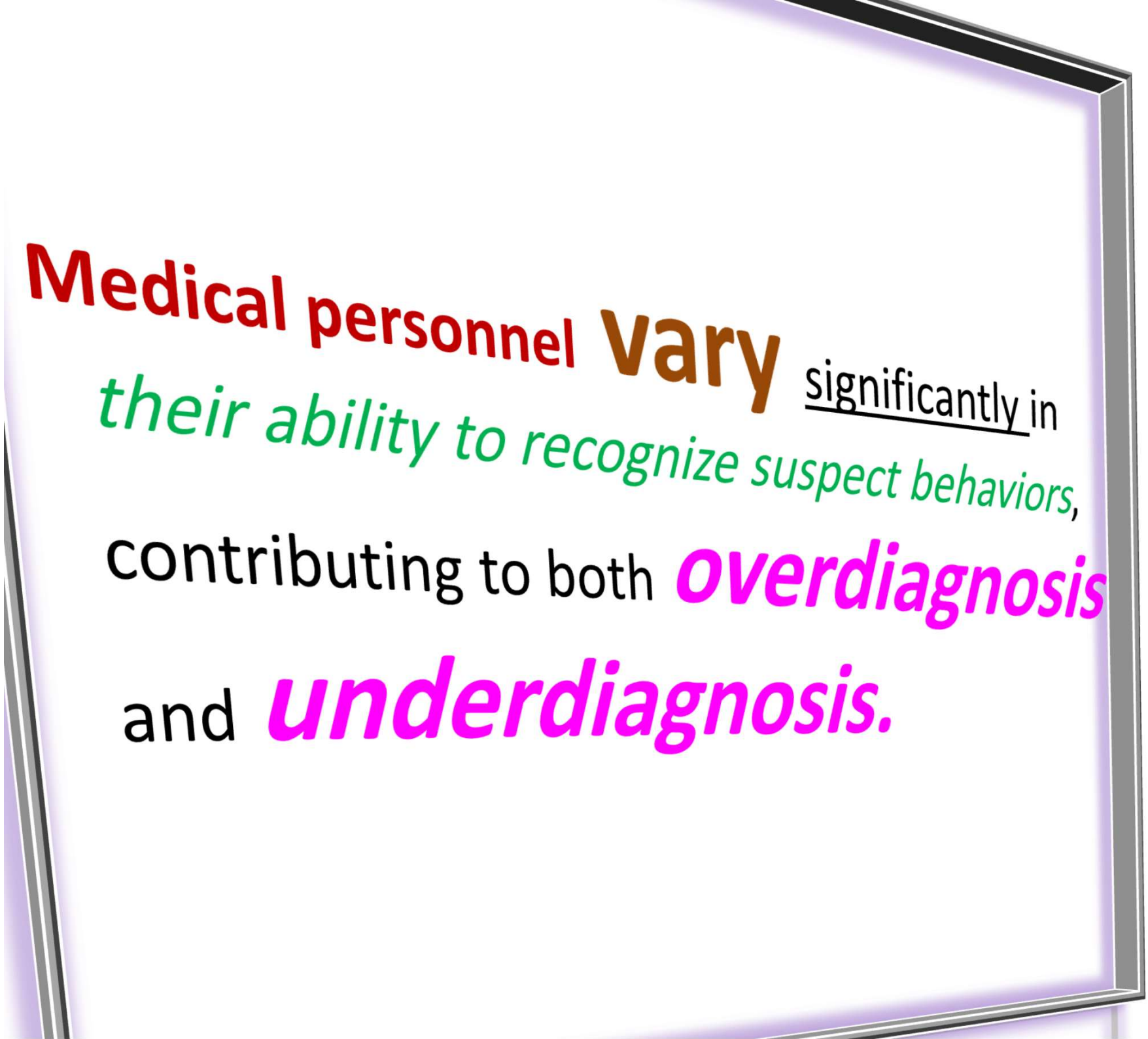
SEIZURES IN NEONATES


Medical personnel vary significantly in
their ability to recognize suspect behaviors,
contributing to both overdiagnosis
and underdiagnosis.

However,

abnormal motor or autonomic behaviors

may represent

age- and state-specific behaviors

in healthy infants,

or nonepileptic paroxysmal conditions in symptomatic infants.

For these reasons, ***confirmation of suspect clinical events*** ***with*** coincident ***EEG*** recordings is now ***more widely recommended.***

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Clinical Categories

- The clinical criteria for neonatal seizure diagnosis were historically subdivided into ***five clinical categories:***

- ***focal clonic***
- ***multifocal or migratory clonic***
- ***tonic***
- ***myoclonic***
- ***subtle seizures***

Hypoxia -Asphyxia

- ***Hypoxia-ischemia (i.e., asphyxia)*** is traditionally considered ***the most common causal factor*** associated with neonatal seizures.

- Neonate suffer <u>asphyxia</u> ***either <u>before</u> or <u>during</u> parturition***, and ***only ١٠% of cases*** of asphyxia result from ***postnatal causes.***
- **<u>When asphyxia is suspected</u>** during the labor and delivery process, **<u>biochemical confirmation</u>** can be attempted.

Hypoxia -Asphyxia

- **The duration of asphyxia is difficult to assess based on either single or even multiple PO_2 values**, but ***pH <٧/٢*** are considered of **greater clinical concern for predicting HIE**, although the suggested guideline of a ***pH <٧/٠*** **is one criterion by which the clinical entity of HIE might be predicted.**

- A metabolic definition of asphyxia ***should also include*** **a base deficit of less than ١٢ mmol/L** ***(BE > - ١٢)*** , although specific researchers suggest ***BE > - ١٦ mmol/L*** because of its ***higher predictive power*** for the ***emergence of the HIE*** syndrome, ***including clinical seizures.***

MAJOR ETIOLOGIES FOR SEIZURES

Hypoglycemia

- ***Significant Hypoglycemia*** is usually defined as ***glucose levels less of ٣٥ to ٤٠ mg/dL (BS < ٥٠).***
- **No clear consensus exists concerning a direct cause-and-effect relationship of hypoglycemia with seizure occurrence.**
- ***Associated disturbances may coexist,*** such as **hypocalcemia**, **craniocerebral trauma**, **cerebrovascular lesions**, and **asphyxia**, which may also ***contribute to lowering the infant's threshold for seizures.***

MAJOR ETIOLOGIES FOR SEIZURES

Hypocalcemia

- ***Total serum calcium*** levels ***below ٧ (٧/٥) to ٨ mg/dL*** generally define hypocalcemia.
- **The ionized fraction** is a ~~**more sensitive indicator**~~ of ~~**seizure vulnerability.**~~
- The exact level of hypocalcemia at which seizures occur is debatable. ***An ionized fraction of ٠/٤ mg/dL or less*** may have a ***more predictable association with the presence of seizures.***


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MAJOR ETIOLOGIES FOR SEIZURES

Cerebrovascular Lesions

- **Hemorrhagic** or **ischemic cerebrovascular lesions** are **associated with neonatal seizure.**
- **IVH** or **periventricular hemorrhage (PVH)** is ***the most common intracranial hemorrhage (ICH) of the preterm infant***, and has been ***associated with seizures*** in ***as much as ٢٥% of a preterm*** population **with EEG-confirmed seizures.**

MAJOR ETIOLOGIES FOR SEIZURES

Infection

- **CNS infections** during the **antepartum** or **postnatal periods** ***can be associated with neonatal seizures.***
- ***Congenital infections***, **commonly referred to** by the acronym ***TORCH*** **can produce severe encephalopathic damage** that results in ***seizures.***

MAJOR ETIOLOGIES FOR SEIZURES

- ***Brain anomalies*** may occur as a result of either **genetic causes** from conception or **acquired defects during the first half of gestation.**
- **Specific dysgenesis syndromes**, such as ***holoprosencephaly*** and ***lissencephaly***, are **often associated** with **characteristic facial** or **body anomalies**.

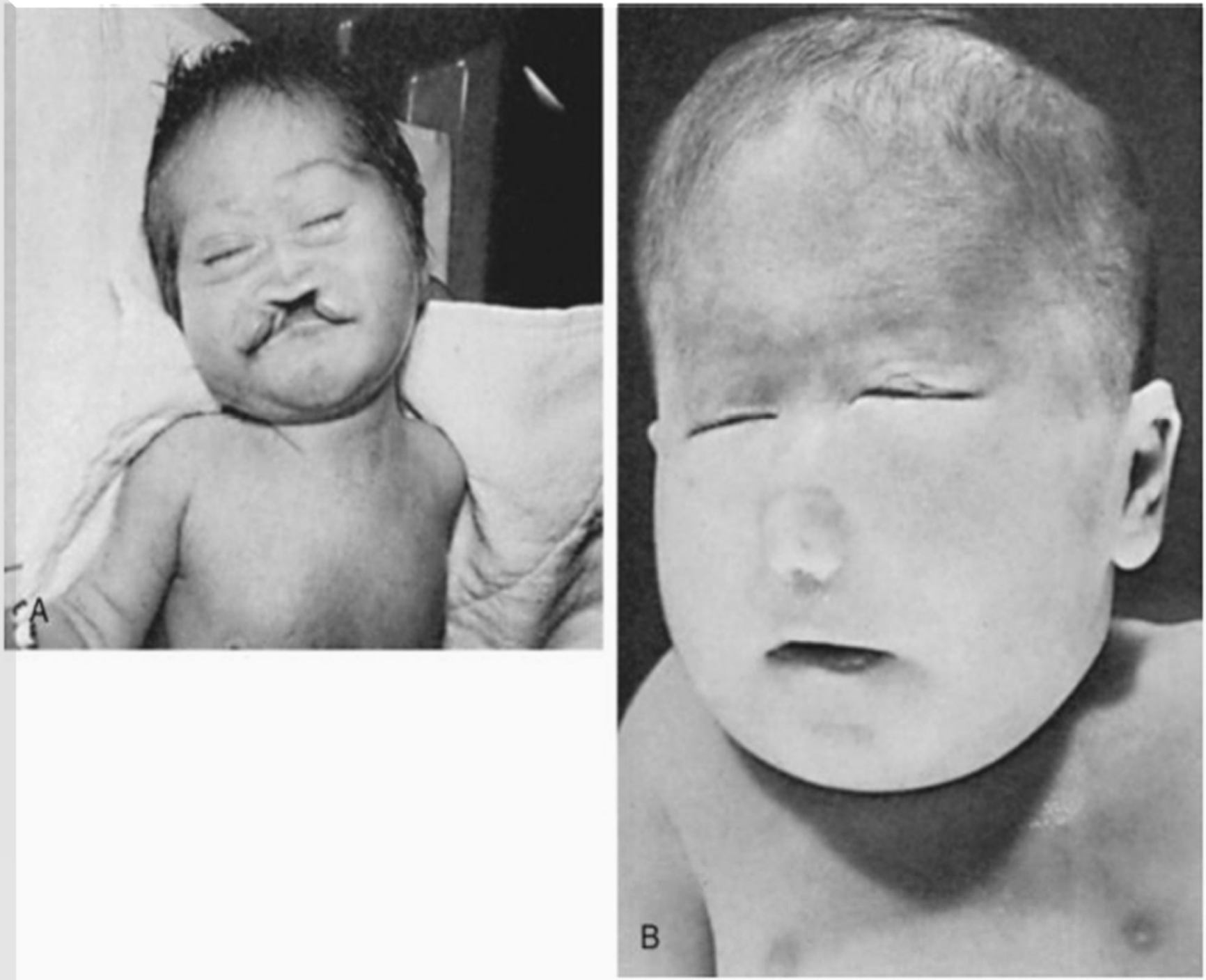

Figure 28-4 Trisomy 13. **A,** Note anomalous midline facial development with hypotelorism, midline cleft lip, and lack of a nose.

MAJOR ETIOLOGIES FOR SEIZURES

- **Exposure to** ***barbiturates, alcohol, heroin, cocaine, or methadone*** commonly presents with **neurologic findings** that include ***tremors*** and ***irritability.***
- ***Depending on the pattern of use*** and ***the timing of last use***, the ***onset of neonatal withdrawal*** from narcotics ***generally begins in the first ٢ to ٣ days after birth*** **but may occur as late as ٤ weeks.**

TREATMENT

- ***Rapid infusion of glucose*** or other supplemental electrolytes **should be** ***initiated before antiepileptic medications.***
- **Symptomatic hypoglycemia** can be readily corrected by ***IV administration of ٢ mL/kg of a ١٠% dextrose*** solution, beginning ***with*** **an infusion** of approximately ***٥ to ٨ mg/kg per minute*** and increased as needed.
- **Persistent hypoglycemia** may **require more hypertonic glucose solutions**. Rarely, ***other*** pharmacologic measures (e.g., **diazoxide**) may be needed to establish a glucose level within the normal range .

TREATMENT

- **Phenobarbital**

- the ***initial loading dose*** is recommended at

  ٢٠ mg/kg(→ ١٠ → ٥ → ٥), with a ***maintenance dose of ٣ to ٤ mg/kg per day.***

- Therapeutic levels are usually suggested to **range from ١٠ to ٤٠ µg/mL**, although there is no consensus with respect to drug maintenance.

TREATMENT

- **Levebel**

- **Phenytoin** **١٥ to ٢٠ mg/kg.**
- **maintenance dose *of* *٤-٥ (٨) mg/kg per day.***
- **Benzodiazepines** **may also** be used to control neonatal seizures. The drug **most widely used** is ***diazepam & midazolam (٠/٠٥-٠/١٥mg/kg -- ٠/٠١-٠/٠٦ mg/kg/h).***

Discontinuation of Drug Use

- **Discontinuation of drugs before discharge from the neonatal unit is usually recommended** so that clinical assessments of arousal, tone, and behavior will not be hampered by medication effect.

Discontinuation of Drug Use

- ***Neonatal seizures rarely reoccur during the first ٢ years*** **of life**

- This **"honeymoon period"** without seizures **commonly persists for many years** in most children, **before isolated or recurrent seizures appear.**

PROGNOSIS

- **Normal findings on interictal EEG** were associated with an **٨٦% chance of normal development at ٤ years** of age in ١٣٩ neonates with seizures.


الامامُ الصّادق عليه السلام: مَن نَفَّسَ عَن مُؤمِنٍ كُربَةً نَفَّسَ اللّهُ عَنهُ كُربَ الآخِرَة
هر که غمی از مؤمنی بزداید خداوند اندوه‌های آخرت را از او برطرف سازد
کافی ج۲ ص۱۹