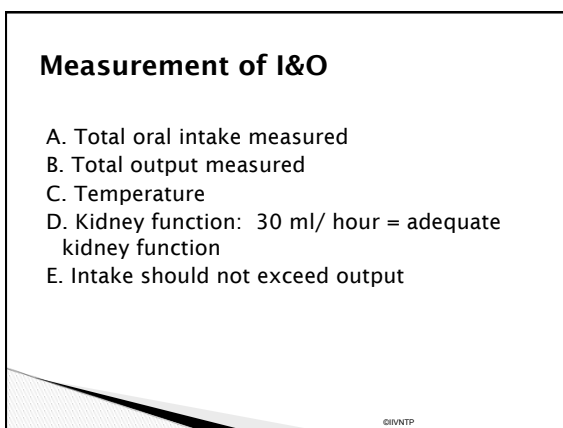


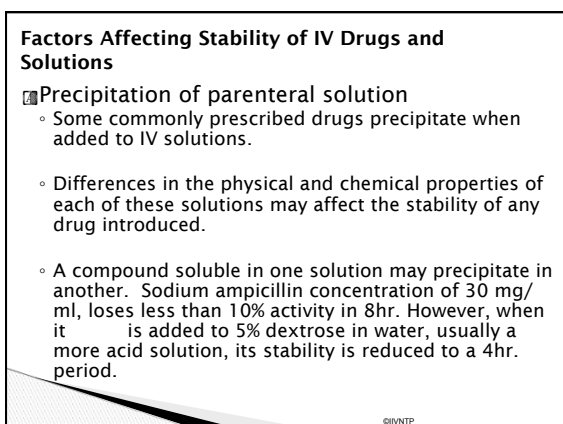
## Fluid Balance

- ▣ Principles of Fluid Balance
- ▣ Initial Assessments:
  - A. Vital signs: BP, pulse, respiratory, weight
  - B. Medications
  - C. Allergies
  - D. Cardiac, liver and kidney function
  - E. Baseline CBC and Chemistry



- F. Should take place every 8 hours if IV therapy is continuous
- G. Fluid control devices should be use to prevent overhydration
- I. Paper time strips can be attached to IV bottles to help assess IV rates
- J. Know how each type of IV fluid effects fluid movement in and out of the cells & plasma based on osmolarity and solution constituents.

The average patient without kidney and cardiac disease can metabolize 1000 mL per 8 hours to maintain hydration.



## Factors Affecting Stability of IV Drugs and Solutions

- ▣ pH
  - A broad pH range (3.5-6.5) of dextrose solutions is allowed by the U.S. Pharmacopeia (USP). A drug may be stable in one bottle of dextrose 5% in water and not in another.
- ▣ Additional Drugs
  - One drug may be compatible in a solution but a second additive may alter the established pH to such an extent to make the drugs unstable.

#### Factors Affecting Stability of IV Drugs and Solutions

##### ☐ Buffering Agents in Drugs

- ☐ Presence of buffers or antioxidants, which may cause two drugs, however compatible, to precipitate. For example, ascorbic acid, the buffering component of tetracycline, lowers the pH of the product and therefore may accelerate the decomposition of a drug susceptible to an acid environment

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#### Factors Affecting Stability of IV Drugs and Solutions

- ☐ Preservatives in the diluents
- ☐ Sterile diluents for reconstitution of drugs are available with or without a bacteriostatic agent.
- ☐ The bacteriostatic agents usually consist of parabens or phenol preservatives.
- ☐ Certain drugs, including nitrofurantoin, amphotericin B, and erythromycin, are incompatible with these preservatives and should be reconstituted with sterile water for injection.

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#### Factors Affecting Stability of IV Drugs and Solutions

- ☐ Degree of dilution
- ☐ Solubility often varies with the volume of solution in which a drug is introduced. For example, tetracycline hydrochloride, mixed in a small volume of fluid, maintains its pH range over 24hr. However when added to a large volume (1L), it degrades after 12hr. becoming less therapeutically active. The b cobalamin(s) also degrade faster in solution

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#### Factors Affecting Stability of IV Drugs and Solutions

- ☐ Period of time solution stands
- ☐ Decomposition of substances in solution is proportional to the length of time they stand. For example, sodium ampicillin, with high pH or 8-10 becomes unstable when maintained in an acid environment over a period of time. B Vitamins are stable longer in a more acid environment.

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#### Factors Affecting Stability of IV Drugs and Solutions

- ☐ Order of mixing  
The order in which drugs are added to infusions often determines their compatibility.
- ☐ Light  
Light may provide energy for chemical reactions to occur.  
Certain drugs, such as Amphotericin B and Nitrofurantoin, alpha lipoic acid, must be protected from light once they are diluted

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#### Factors Affecting Stability of IV Drugs and Solutions

- ☐ Room Temperature  
Heat provides energy for reactions.  
After reconstitution or initial dilution, refrigeration prolongs the stability of many drugs. Water soluble vitamins, selenium and calcium chloride. (calcium gluconate will precipitate if too cool)

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