Cardiac Pharmacology

Cardiotonic and Misc. Inotropic
Chapter 38

- Cardiotonic (Cardioglycosides)
- Inotropic
- Digoxin Specific Antidote

Cardiotonic

- Action / Use
  - Increase cardiac output
  - Heart Failure
  - Slow conduction through AV node
  - Atrial Fibr.
- Adverse Reactions
  - CNS
    - Headache
    - Weakness
    - Visual disturbances
      - Yellow/green halos
  - GI
    - Nausea
    - Loss of appetite
  - Cardiac
    - Arrhythmias / EKG changes

- Heart Failure
- Slow conduction through AV node

- Adverse Reactions
- Yellow/green halos

- CNS
- GI

- Headache
- Nausea

- Weakness
- Loss of appetite

- Visual disturbances
- Arrhythmias / EKG changes
• Contraindication
  – Toxicity
  – Hypersensitivity

• Precautions
  – Electrolyte Imbalance
  – MI
  – Heart Blocks
  – Renal and Liver Impairment
  – Pulmonary Edema
  – Pregnancy

• Nursing alert
  – Narrow margin of safety
  – Even normal doses may produce side effects or toxicity
  – Rapid onset
  – Dose individualized
    – Digitalization – series of doses to exert full therapeutic effect
    – Serum digoxin levels checked regularly
    – Monitor patient closely

• Interactions
  – Action delayed with food
  – Decreased with high fiber
  – Many drugs increase or decrease plasma level
    – Generic / Trade names
    – Digoxin (Lanoxin, Lanoxicaps, Digitek)
Misc. Inotropics

- Use
  - Short term treatment of Heart Failure
  - Given IV
  - Stopped if Hypotension occurs
  - Nurse to monitor V/S closely
  - Not a cure but control of symptoms of Heart Failure
- Generic / Trade name
  - Milrinone (Primacor)

Digoxin Specific Antidote

- Use in cases of Digoxin toxicity
- Dose depends on blood level
- Adverse reaction – hypokalemia and reemergence of A Fib or Heart Failure
  - Generic / Trade name
    - Digoxin immune fab (Digibind)

Antianginal and Peripheral Vasodilating Drugs

- Antianginals
  - Nitrates
  - Calcium Channel Blockers
  - Purpose is to increase blood supply by dilating blood vessels
  - Relaxes smooth muscle
Nitrates

• Action / Uses
  – Relaxes smooth muscle of the artery and as result increase blood flow
  – Treats acute anginal episodes
  – Prevents angina
  – Treats chronic or stable angina
  – Control hypertension peri-op (IV)

• Adverse Reactions
  – Related to the vasculature dilating

• Contraindications / Precautions
  – Hypersensitivity
  – Anemia
  – Glaucoma
  – Postural hypertension
  – Head trauma or cerebral event
  – Cautiously
    • Renal and liver
    • Head trauma
    • Hypothyroidism
    • Pregnancy and lactation

• Interactions
  – Recreational substances
  – like acting drugs
  – Headache treatment
  – ASA
  – Heparin
  – Viagra – can cause death
Calcium Channel Blockers

- **Action**
  - Limits movement of calcium across smooth muscle cell membranes
  - Less calcium to transmit nerve impulses
  - Slows conduction
  - Decreases Myocardial contractility
  - Dilates arteries

- **Use**
  - Angina
  - Hypertension

- **Adverse reactions**
  - CNS
  - GI
  - Cardiac
  - Other

- **Contraindications / Precautions**
  - Hypersensitivity
  - SSS
  - AV Blocks w/o pacemaker
  - Hypotension
  - Cautious in Heart Failure, Renal and Liver impairment, and Pregnancy and Lactation

- **Interactions**
  - GI ulcer therapy – increased effect of CCB
  - Theophylline - increased effect of drug
  - St John’s Wort – reduced CCB concentrations
  - Digoxin – increased dig. toxicity
  - Rifampin – decreased CCB effect
Administration

- Nitrates
  - Sublingual
  - PO
  - IV
  - Topical
- Calcium Channel Blockers
  - Po
  - IV

Generic / Trade

- Nitrates
  - Isosorbide (family) – (ISMO, Imdur, Isordil)
  - Nitroglycerin (family) – (Nitro Bid, Nitrostat, Nitro-Dur, Transderm-Nitrol)
- Calcium Channel Blockers
  - Amlodipine (Norvac)
  - Diltiazem (Cardizem)
  - Nicardipine (Procardia, Adalat)
  - Verapamil (Calan, Isoptin)

How to take Nitrates

- Administered SL, spray, PO, IV, Topical, transdermal
- SL
  - Under front of tongue
  - Not swallow
  - Be sitting or lying down
  - May take up to 3; 5 min apart; if no relief call 911
  - Dark, dry, cool place, if open lose effectiveness with time
- Topical
  - Clean skin
  - One on one off
  - Wash hand before and after
  - Like wise for transdermal
Peripheral Vasodilating and Miscellaneous Vasodilating Drugs

• Intent is to improve blood flow to the vessels in the extremities
  – Action
    • Dilates vessels and inhibits platelet aggregation
  – Use
    • PVD
    • Cerebral Vascular Insufficiency
    • Circulatory problems of the Inner Ear
    • Some causes of inter. claudication
  – Adverse Reactions
    • Hypotension
    • Increased pulse
    • Headache
    • Nausea
    • Flushing, Sweating, Rash

• Contraindications
  – Hypersensitivity
  – Imed. Postpartum
  – Heart Failure
  – Arterial bleeding
  – Use cautiously in those with bleeding tendencies, severe cardiac and cerebral vascular disease.

  – Cilostazol (Pletal)
  – Papaverine (Pavabid Plateau)

Antihyperlipidemic Drugs

Chapter 42

• Bile Acid Sequestrants
• HMG-CoA Reductase Inhibitors
• Fibric Acid Derivatives
• Miscellaneous
**Bile Acid Sequestrants**

- **Actions**
  - Bind to bile acids so not absorbed
  - Causes liver to use stored cholesterol to manufactures needed bile
- **Uses**
  - Hyperlipidemia
  - Pruritus w/ partial biliary obstruction
- **Adverse Reactions**
  - Constipation
  - Increased bleeding tendencies

- **Contraindications**
  - Hypersensitivity
  - Complete Biliary Obstruction
- **Precautions**
  - Liver and Kidney Disease
  - Pregnancy and lactation
- **Interactions**
  - Anticoagulants
  - Many others drugs have decreased serum level or GI absorption

**Generic / Trade Names**

- Cholestyramine (Questran)
HMG-CoA Reductase Inhibitors

- **Action**
  - Enzyme that inhibits manufacture of or promotes to breakdown of cholesterol

- **Uses**
  - Supplement dietary treatment of hyperlipidemia
  - Prevention of primary and secondary cardiac events R/T hyperlipidemia

- **Adverse Reactions**
  - Headache, dizziness
  - Insomnia
  - GI discomforts
  - Elevated CK levels
  - Rhabdomyolysis with possible renal failure

- **Contraindications**
  - Hypersensitivity
  - Serious liver disorders
  - Pregnancy (Category X)

- **Precautions**
  - Alcoholism
  - Acute infection
  - Hypotension
  - Trauma
  - Hypotension
  - Myopathy

- **Interactions**
  - If in combination with other hyperlipidemic agents, anti-infectives, amiodarone, verapamil, protease inhibitors, and warfarin there is an increased risk of problems
    - a.k.a. statins * hint
## Generic / Trade Names

- Atorvastatin (Lipitor)
- Lovastatin (Mevacor)
- Pravastatin (Pravachol)
- Simavastatin (Zocor)

### Nursing
- Pts should use caution with grapefruit (not more than a quart of juice a day)

## Fibric Acid Derivatives

### Action
- Stimulates the liver to breakdown VLDL’s to LDL’s
- Stimulates breakdown of triglycerides
- Increases excretion of cholesterol in feces
- Reduces production of triglycerides

### Uses
- Hyperlipidemia and elevated triglycerides
- Reason depends on drug used

### Adverse Reaction
- GI Upset w/ N/V/D
- Cholelithiasis or Cholecystitis

### Contraindications
- Hypersensitivity
- Renal or Liver dysfunction
- Primary biliary cirrhosis
• Precautions
  – Pregnancy and Lactation
  – Peptic ulcer disease
  – Diabetes
• Interactions
  – Anticoagulants
  – Cyclosporine
  – Sulfonylureas
  – HMG-CoA inhibitors

Generic / Trade Name

• Fenofibrate (Tricor, Lofibra)
• Gemfibrozil (Lopid)

Misc. Antihyperlipidemic

• Actions
  – Unknown
• Uses
  – Adjunctive therapy for those at risk for pancreatitis
• Adverse Reactions
  – GI – N/V/D, Abd pain
  – Flushing, itching
• Contraindications
  – Hypersensitivity to niacin
  – Active peptic ulcer disease
  – Hepatic dysfunction
  – Arterial bleeding
• Precautions
  – Renal dysfunction
  – High alcohol consumption
  – Unstable angina
  – Gout
  – Pregnancy

Generic / Trade Name
• Ezetimibe (Zetia)
• Niacin (Niaspan, Niacor)

Antiarrhythmic Drugs
Chapter 39
• General action – treatment of arrhythmia
• Goal – restore rhythm or rate or both
• Prevent life-threatening arrhythmia
<table>
<thead>
<tr>
<th>Class I</th>
<th>Anesthetic effect on myocardium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ia</td>
<td>Prolongs the action potential</td>
</tr>
<tr>
<td></td>
<td>• Procainamide (Pronestyl)</td>
</tr>
<tr>
<td></td>
<td>• Quinidine (Quinaglute)</td>
</tr>
<tr>
<td></td>
<td>– Contraindicated in myasthenia gravis</td>
</tr>
<tr>
<td>Ib</td>
<td>Shortens action potential</td>
</tr>
<tr>
<td></td>
<td>– Decreases diastolic depolarization and automaticity of ventricular cells</td>
</tr>
<tr>
<td></td>
<td>• Lidocaine (Xylocaine)</td>
</tr>
<tr>
<td>Ic</td>
<td>Profound slowing of conduction</td>
</tr>
<tr>
<td></td>
<td>• Flecainide (Tambocar)</td>
</tr>
<tr>
<td></td>
<td>• Propafenone (Rhythmol)</td>
</tr>
</tbody>
</table>
Class II

• Beta Blockers

• Will be covering more in depth in another chapter

Class III

– Prolongs refractory period and repoalarization
  • Amiodarone (Cordarone, Pacerone)
  • Ibutilide (Corvert)
  • Sotalol (Betapace)
  • Dofetillide (Tikosyn) Expensive

• Bretylium (Bretylol)
  – ACLS protocol in cardiac arrest
  – Given only IV extreme hypotension

Class IV

a.k.a. Calcium Channel blockers

• Inhibits movement of calcium through channels across the myocardial cell membrane and smooth muscle
• Depresses depolarization
• Lengthens repolarization
  – Verapamil (Calan)
General Class - Uses

- Treatment of PVC’s
- V-Tach
- PAC’s
- PAT
- Atrial arrhythmias
- Reduce risk for death and repeat MI

Adverse Reactions

- CNS
  - Light headed
  - Weakness somnolence
- Cardiac
  - Hypotension
  - Arrhythmia (called pro arrhythmia effect)
  - Bradycardia
- Other
  - Urinary retention
  - Local inflammation

Contraindication

- Hypersensitivity
- Pregnancy and lactation
- AV heart block (w/o pacemaker)
- Severe Heart Failure
- Hypotension
- Cardiogenic shock
Precautions / Interactions

- Hepatic disease
- Electrolyte Imbalance
- Heart Failure
- Renal Impairment
- Interactions
  - assorted

Anticoagulant and Thrombolytic Drugs

Chapter 43

- Anticoagulant
  - Oral
  - Parenteral
- Antiplatelet Agents
- Thrombolytic
- Anticoagulant Antagonist

Oral and Parenteral Anticoagulants

- Oral
  - Warfarin (Coumadin) also can be given IV
    - Peak activity 1.5 to 3 day
    - Choice for long term therapy
    - Requires regular lab checks (PT, INR)
- Parenteral (IV)
  - Heparin (none)
    - Requires frequent lab checks (PTT)
- Low-Molecular Weight Heparins
  - Dalteparin sodium (Fragmin)
  - Enoxaparin (Lovenox)
    - Stable - infrequent lab check needed (PT and Pts)
Reasons for use

• Anticoagulants and antiplatelets
  – Prevent formation of, or extension of an existing thrombus
• DOES NOT Reverse, breakdown or repair damage done by clots!

Action

• All interfere with clotting mechanism
  – PO
    • Interferes with the manufacture of Vit K depleting clotting factors hence depleting prothrombin
  – IV & sub-q
    • inhibits formation of fibrin by inhibiting the conversion of fibrinogen to fibrin
    • Cannot be taken PO b/c inactivated by gastric juices

Uses

• Prevention of DVT, thrombus after valve replacement
• Prevention and treatment of A Fib w/ emboli, PE,
• Adjunctive treatment of MI
• Parenteral
  – Prevention of post-op DVT and PE with abdominal, arterial, and heart surgery
  – Prevention of cerebral thrombosis in non-hemorrhagic events
  – Diagnosis of DIC (disseminated intravascular coagulation)
Adverse Reactions

• Bleeding
• GI
• Rash
• Hepatitis
• Local irritation

Contraindication

– Hypersensitivity
– Hemorrhagic Disease and Bleeding Disorders
– Recent surgery
– Renal and hepatic disease
– Lactation
– Hypersensitivity to pork products

Precautions

– Bleeding or hemorrhage disorders or disease
– Diabetes
– Renal and hepatic disease
– Females of childbearing age must use reliable precautions
– Psychoses or depression

Interactions

– See chart in book
## Antiplatelet Drugs

- **Action**
  - Interferes with the platelets ability to stick together
- **Uses**
  - Patients at risk for acute embolic events
- **Adverse Reaction**
  - Palpitations
  - Bleeding
  - Dizziness, headache
  - N/V/D
- **Contraindication**
  - Hypersensitivity
  - Pregnancy
  - Bleeding

### Precautions
- Elderly
- Renal and hepatic disorders
- Pancytopenia

### Interactions
- ASA and NSAIDs
- Digoxin
- Phenytoin

### Generic / Trade Names
- Cilostazol (Pletal)
- Clopidogrel (Plavix)
- Ticlopidine (Ticlid)
- Dipyridamole (Persantine) used w/ ASA
  - The following are given IV after angioplasty
    - Abciximab (Reo-Pro)
    - Eptifibatide (Integrillin)
    - Tirofiban (Aggrastat)
Thrombolytic Drugs

- **Actions**
  - Breaks down fibrin in clots and reopens the blood vessel

- **Uses**
  - Acute MI
  - PE, and DVT
  - Occlusions of CV catheters

- **Adverse Reactions**
  - Bleeding
  - Hypersensitivity

- **Contraindications**
  - Hypersensitivity
  - Active Bleeding
  - History of stroke, aneurysm, and recent intracranial surgery

- **Precautions**
  - Recent surgery
  - GI Bleed
  - Trauma
  - Hypertension
  - Diabetes
  - Current anticoagulant therapy

- **Interactions**
  - Antiplatelet therapy
  - Anticoagulant Therapy

- **Generic / Trade Name**
  - Streptokinase (Strephtase)
  - Urokinase (Abbokinase)
  - TPA (tissue plasminogen activator)
Nursing Process

- Lab values
  - PT (protime) and INR (international normalized ratio) for warfarin administration
  - Notify if PT exceed 1.5 time control and INR is greater than 3
  - Checked daily until dose regulated
  - When stabilized every 4-6 weeks
  - PTT (partial thromboplastin time)
  - Level checked every 6 hours to daily
  - Platlet counts, hematocrit, and occult blood

- Uses
  - Shock
  - Hypotension
  - Allergic Reaction
  - Some Arrhythmias
  - Resp. Distress
  - Nasal congestion, Glaucoma

Anticoagulant Antagonist

- Phytonadione (Vit K) (Aqua-Mephyton)
  - Treatment of warfarin overdosage
- Protamine sulfate
  - Treatment of heparin overdosage
Adrenergic Blocking Drugs
Chapter 28
(a.k.a. Sympathomimetic Blocking drugs)

- Alpha Blocking
- Beta Blocking
  - Beta 1
  - Beta 2
- Alpha / Beta Adrenergic Blocking
- Antiadrenergic Blocking
  - Centrally Acting
  - Peripherally Acting

Alpha Adrenergic Blocking
Actions / Uses

- Results in vasodilatation by relaxing smooth muscle
- Used for Hypertension caused by adrenal tumors
- Hypertension during pre-op preparation
- Prevent or treat tissue damage of infiltration of dopamine

Adverse Reactions

- Weakness, Hypotension, arrhythmias

Contraindications, Precautions and Interactions
- Hypersensitivity
- CAD
- Preg. and Lactation
- Recent MI
- Renal Failure
- Raynaud’s
- Reacts with Phentolamine (Regitine)
Generic / Trade name

- Phentolamine (Regitine)

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Beta Adrenergic Blocking Drugs
Actions
a.k.a Beta Blockers

- Decrease stimulation of the sympathetic nervous system at receptor sites
- Beta receptors are found in the heart
- Decreases rate, excitability, workload and oxygen consumption, contributes to antiarrhythmic effect, treat glaucoma

---

Uses

- Hypertension
- Cardiac arrhythmias (Ventricular and SVT)
- Migraines
- Angina Pectoris
- Glaucoma
- Reinfarction in recent MI
Adverse Reactions

• Cardiac – Hypotension, bradycardia, dizziness
• GI – Hyperglycemia, N/V/D
• Resp. – Bronchospasm with hx. Asthma
• Most sx. are mild & resolve with treatment
• Depression
• Serious Symptoms of Heart Failure

Contraindication, Precautions,

• Hypersensitivity
• Cardiac – Bradycardia, heart-blocks, heart failure, hypotension
• Respiratory – Asthma, emphysema
• Caution – diabetes, peptic ulcer
• Interactions – antidepressants, NSAIDS, Loop diuretics
• Nursing alert – Elderly at increased risk to develop adverse reactions

• Acebutolol (Sectral)
• Atenolol (Tenormin, Tenoretic)
• Metoprolol (Lopressor)
• Propranolol (Inderal)
• Sotalol (Betapace)
• Pindolol (Visken)
• Nadolol (Corgard)

• * hint note olol at end of generic name
**Alpha / Beta adrenergic Blocking**

**Action / Use / Adverse Reaction**

- Blocks stimulation of both receptors
- Allow peripheral dilation
- Treat essential hypertension (Coreg)
- Heart Failure to reduce progression
- Hypertension (labetalol, alone or with other drugs)
- Mild, General systemic,

---

**Contraindication, Precaution**

- Hypersensitivity
- Bronchial asthma
- Decompensated Heart Failure
- Severe Bradycardia
- Cautious use: drug controlled heart failure, diabetes, impaired cardiac and hepatic function, preg. and lactation

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**Interactions**

- Antidepressants, digoxin, cimetidine, clonidine. Increased action the Alpha/Beta blocker.
Generic / Trade Names
- Carvedilol (Coreg)
- Labetalol (Trandate, Normodyne)

Antiadrenergic Drugs
Actions / Uses / Adverse Reactions
- Peripherally acting and Centrally acting
- Inhibits release of norepinephrine
- Treats cardiac dysrhythmias and hypertension
- Side Effects: Dry mouth, sedation, effect on CNS, hypotension

Contraindications / Precautions
- Active Hepatic disease
- Antidepressant therapy
- Hypersensitivity
- Hepatic and Renal Impairment
- Pregnancy and lactation
Interactions – Increased effect

- Anesthetic drugs
- Lithium
- Haldol

- Decreased Effect
  - Adrenergic Drugs Beta Blockers
  - Beta Blocking Drugs
  - Levopoda

Nursing Process

- Assessment
- Monitoring
- Planning/ Implementation

- Intervention
  - Assessment
  - Teaching
Antihypertensive Drugs

Chapter 41

- Peripheral Vasodilating
- Beta Adrenergic Blocking
- Antiadrenergic
- Alpha Adrenergic Blocking
- Alpha and Beta Adrenergic Blocking
- Angiotension Converting Enzyme Inhibitors (ACE Inhibitors)
- Angiotensin II Receptor Antagonist
- Hypertensive Emergency

ACE Inhibitors

- Action / Use
  - Suppression of the renin-angiotension-aldosterone system.
  - Prevents the enzyme that allows angiotension I from converting to angiotension II
  - Used for treatment of hypertension
    - Severe
    - Unresponsive to other therapies
    - Combined for better effect
Generic / Trade Names

- Cartopril (Lotensin)
- Enalapril (Vasotec)
- Fosinopril sodium (Monopril)
- Lisinopril (Prinivil, Zestril)
- Quinipril (Accupril)
- Ramipril (Altace)

* hint note pril in generic name

Angiotension II Receptor Antagonist

• Action
  – Blocks the binding of the angiotension II at the receptor sites in the smooth muscle and adrenal gland

Adverse Reactions

• ACE Inhibitors
  – GI
  – Rash
  – Cough, Dry mouth, tachycardia, hypotension
• Angiotension II Receptor Blockers
  – Fatigue, depression, H/A, syncope
  – GI
  – hypotension, symptoms of Upper
  – Resp. Infection, Cough
- Contraindications
  - Impaired renal function
  - Heart Failure
  - Salt or volume depletion
  - Pregnancy and lactation

- Precautions
  - Na depletion
  - Hypovolemia
  - Coronary and cerebral vascular insufficiency
  - Diuretic therapy or Dialysis

- Nursing Alert
  - Blood pressure and pulse must be obtained immediately before each administration
  - If a significant decrease from baseline values. Hold and call M.D.
  - Do not discontinue abruptly

- Interactions
  - Diuretics
    - Loop
    - Potassium Sparing
  - Antihypertensives
  - NSAIDS
  - Hypoglycemics
  - Digoxin
Hypertensive Emergency

- Treatment of extremely high blood pressure to prevent damage to target organs.
  - Target organs are heart, kidney, eyes
  - Given IV quickly
  - Drugs used
    - Dicloxic (Hyperstat)
    - Nitroprusside (nitropress)
    - *hint ide in generic name

Diuretics
Chapter 45

- Carbonic Anhydrase Inhibitors
- Loop
- Osmotic
- Potassium Sparing
- Thiazide and Related

- Uses
  - Edema
  - Hypertension
  - Renal Disease (acute failure, renal insufficiency)
• Adverse Reactions
  – Symptoms related to hypovolemia
  – Hypotension
    • Hypokalemia, hyperkalemia
• Contraindication
  – Hypersensitivity
  – Electrolyte imbalance
  – Renal and liver dysfunction
• Precautions
  – Renal dysfunction
  – Pregnancy and lactation
• Interactions
  – Antihypertensives (see chart in book)

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Carbonic Anhydrase Inhibitors

• Action
  – Inhibits carbonic anhydrase results in excretion of Na, K, BiCarbonate

• Generic / Trade names
  – Acetazolamide (Diamox)

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Loop Diuretics

• Actions
  – Increase excretion of Na and Cl by inhibiting reabsorption in the distal, proximal tubules and loop of Henle
  – Causes K loss

• Generic / Trade Names
  – Bumetanide (Bumex)
  – Furosemide (Lasix)
**Osmotic Diuretics**

- **Action**
  - Increases density of filtrate in glomerulus
  - Prevents selective reabsorption increasing excretion
  - Na and Cl excreted also
- **Generic/ Trade Names**
  - Mannitol (Osmitrol)

**Potassium Sparing Diuretics**

- **Actions**
  - Depresses reabsorption of Na in tubules hence increasing Na and water excretion
  - Depresses K excretion
- **Adverse Reaction**
  - Hyperkalemia (Check K levels)
- **Generic / Trade Names**
  - Amiloride (Midamor)
  - Spironolactone (Aldactone)
  - Triamterene (Dyrenium)

- **Generic / Trade Name**
  - Chlorothiazide (Diuril)
  - Hydrochlorothiazide, HCTZ (HydroDIURIL, Esidrix)
  - Metolazone (Zaroxolyn)
Thiazide and Related Diuretics

• Action
  – Inhibits reabsorption of Na and Cl in ascending portion of loop of Henle and early distal tubule in the nephron
  – Increases excretion of Na, Cl and water

Adrenergic Drugs
   Chapter 27
      (a.k.a. Sympathomimetic drugs)
Acts like Norepinephrine and Epinephrine
Primary site of action – Heart, blood vessel and smooth muscle

Action
  CNS - Increase alertness
  ANS – Smooth muscle relaxation, constriction of Blood Vessels
  Cardiac – Increase rate
  Metabolic – Increase use stored substances

• Assessment
  – Check site of injection, insertion
  – Check area of DVT or other occlusion

• Teaching
  – Keep appointments for Lab checks
  – Safety
  – Bleeding risk
  – Wear Medic Alert
  – Avoid Foods high in Vit K
    • Spinach (dark green leafy)
• Adverse Reactions
  – Cardiac arrhythmias
  – Headache
  – N / V
  – Increased B/P (poss. Dangerously)

• Contraindications
  – Hypersensitivity
  – Some arrhythmias
  – Adrenal Gland Tumors
  – Narrow-angle Glaucoma
  – Local anesthesia of fingers and toes
  – Supine hypertension

• Precautions
  – Cardiac Disease
  – Hyperthyroidism
  – Diabetes
  – Pregnancy
• Interactions
  – Antidepressants
  – Anti-seizure
  – Digoxin
  – Beta adrenergic Blocking Drugs

Nursing Implications
• Assessment pre and post administration
• Monitor Tissue Perfusion
• Cardiac Output
• Impaired Sleep
• Teaching

Trade / Generic names
• Dobutamine (Dobutrex)
• Dopamine (Intropin)
• Epinephrine (Epi-Pen)
• Norepinephrine (Levophed)