1. Muscle Spasms
	* Involuntary contraction of a muscle or muscle group
	* Causes pain and decreased function
	* Causes may be epilepsy, hypocalcemia, acute and chronic pain syndromes, trauma
	* Drug therapy- may include analgesic anti-inflammatory agents, (e.g. aspirin), and centrally acting muscle relaxants.
* Agents- Centrally Acting Muscle Relaxants
* Baclofen (Lioresal)
* Diazepam (Valium)
* Carisoprodol (Soma)
* Chlorphenesin (Maolate)
* Chlorzoxazone (Paraflex, Parafon Forte, Remular-S)
* Cyclobenzaprine (Flexeril)
* Medaxalone (Skelaxin)
* Methocarbamol (Robaxin)
* Orphenadrine (Norflex)
* Tizanidine (Zanaflex)
1. Mechanism of Action for Centrally Acting Muscle Relaxants
	* Mechanism uncertain, but probably from sedative properties
	* Has no direct effect on skeletal muscle
	* Diazepam and tizanidine enhance presynaptic inhibition of motor neurons in CNS
	* Enhancing effects of GABA (gamma-aminobutyric acid), an inhibitory neurotransmitter
	* Baclofen suppresses hyperactive reflexes in spinal cord (possibly by mimicking the actions of GABA on spinal neurons)
2. Therapeutic Uses
* Treats localized spasm
* Decreases pain
* Increases ROM (Range of Motion)
* Reduces spasticity from multiple sclerosis, spinal cord injury, and cerebral palsy, but not stroke, Parkinson’s disease, or Huntington’s chorea
1. Adverse Effects
	* CNS depression (drowsiness, dizziness, lightheadedness)
	* Potential liver damage
	* Physical dependence
	* Baclofen side effects: nausea, constipation, urinary retention
	* Cyclobenzaprine and orphenadrine- Atropine-like effects (dry mouth, blurred vision, photophobia, urinary retention, constipation)
	* Tizanidine- dry mouth, hypotension, hallucinations, and psychotic symptoms
	* Metocarbamol- urine discoloration (brown, black, or dark green)
	* Chlorzoxazone- causes hepatic necrosis and should not be used
	* Diazepam- potential for fetal harm during pregnancy, especially during the first trimester. Readily enters breastmilk, increasing to toxicity in infant
2. Patient Teaching Needed
* Avoid hazardous activities if significant CNS impairment occurs
* Avoid alcohol or other CNS depressants (prevent intensified depressant effects)
* Abrupt withdrawal can cause hallucinations, paranoid ideation, and seizures. When discontinued, withdraw gradually.
* Warn women of childbearing years about potential for fetal harm if they become pregnant while taking diazepam (a benzodiazepine). If pregnancy occurs, drug should be withdrawn.
* Discourage women from breastfeeding while on diazepam
1. Medication Administration
* Usually oral route
* IV or IM route possible for methocarbamol or diazepam
* Baclofen may be administered by intrathecal infusion using implantable pump, if needed
* Diazepam may be given with food if gastric upset occurs. May be given rectally for treatment of seizures.
1. Agents- Direct Acting Muscle Relaxants
* Spasticity is movement disorder with heightened muscle tone, spasm, and loss of dexterity
* Usually combined with physical therapy
* Dantrolene (Dantrium)- promotes muscle relaxation by acting directly on skeletal muscle
1. Mechanism of Action for Direct Acting Muscle Relaxants
* Relieves spasm by suppressing release of calcium from the sarcoplasmic reticulum (SR) so skeletal muscles are less able to contract
* Therapeutic doses have minimal effects on smooth muscle or cardiac muscle
1. Therapeutic Uses
* Treats spasticity from multiple sclerosis, cerebral palsy, spinal cord injury, or stroke
* Treats malignant hyperthermia, a rare, life-threatening syndrome from anesthesia or succinycholine, a neuromuscular blocking agent
1. Adverse Effects
* Decreases strength, and may reduce overall function
* Liver damage- contraindicated with active hepatic disease (cirrhosis, hepatitis). Use lowest effective dosage for shortest time necessary
* Muscle weakness, drowsiness, diarrhea, anorexia, nausea, vomiting, acne-like rash
1. Patient Teaching Needed
* Signs of liver dysfunction (jaundice, abdominal pain, malaise)
* Need liver function tests before initiating treatment and periodically
* Monitor for reduction in muscle strength
* Avoid hazardous activities if significant depressant effects occur
* Avoid CNS depressants
1. Medication Administration
* If no beneficial effects within 45 days, drug should be withdrawn
* Usually oral dosing. May be given IV push when treating Malignant Hyperthermia crisis
* For prevention of Malignant Hyperthermia prior to surgical anesthesia, give dantrolene 1-2 days prior to surgery
1. Therapeutic Goal
* Relief of signs and symptoms of muscle spasm and spasticity

Lehne, R. A. (2004). Drugs for muscle spasm and spasticity. In R. Carter & L. Henderson (Eds.). Pharmacology for nursing care (pp. 209-213). St. Louis: Saunders.