POLICY AND COMMUNICATIONS BULLETIN
THE CLINICAL CENTER

Medical Administrative Series

M94-7 (rev.) 4 October 2000

MANUAL TRANSMITTAL SHEET

SUBJECT: Direct Intravenous Injection of Therapeutic and Diagnostic Agents (IV Push)

1. Explanation of Material Transmitted: This bulletin transmits revised information defining the term, "IV Push," and provides guidance regarding medications that can be administered via this method. The policy was reviewed by the Medical Executive Committee on 3 October 2000 and approved with changes.

2. Material Superseded: MAS No. M94-7 (rev.), dated 17 June 1997

3. Filing Instructions: Pharmacy Section

   Remove: No. M94-7 (rev.), dated 17 June 1997

   Insert: No. M94-7 (rev.), dated 4 October 2000

DISTRIBUTION

Physicians, Dentists and Other Practitioners Participating in Patient Care

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SUBJECT: Direct Intravenous Injection of Therapeutic and Diagnostic Agents (IV Push)

BACKGROUND

The Clinical Center "IV Push" policy was developed to advise healthcare professionals on medications that may be safely administered by direct intravenous injection.

This policy applies to all personnel who administer intravenous medications.

POLICY

Drugs included in the addenda to this policy are approved for direct intravenous injection. Exclusion of a drug does not necessarily imply that it cannot be given intravenously or that it cannot be given by direct IV injection. Guidance regarding the appropriateness of administering medications by the IV Push method should be obtained from the Drug Information Service or a Clinical Center pharmacist.

DEFINITION

Unless otherwise specified, "IV Push" means the direct injection of a medication into a vein or a flowing intravenous line over 3 to 5 minutes.

CONSIDERATIONS

Some drugs should not be given by direct intravenous (IV) injection because this method of administration may result in adverse effects. Medications are approved for IV Push administration by the Pharmacy and Therapeutics Committee of the Medical Executive Committee. The attached lists include drugs commonly used at the Clinical Center that can be given by direct intravenous injection. The lists exclude cancer chemotherapy medications and investigational drugs.

Administration of all medications, especially via the IV Push method, is contingent on the competency of the healthcare professional and, in some cases, the availability of specialized monitoring capability. The specific conditions under which a nurse can administer IV medications are defined in Nursing Department policy/standards of practice.

Physicians may choose to personally administer by direct intravenous injection doses larger than those specified by this policy, or they may request that the drug be administered as an intermittent intravenous infusion via the I.V. Piggyback mode of delivery.

This policy will be updated regularly and must be reviewed at least once annually by the Pharmacy and Therapeutics Committee.

Addendum A

The following medications can be administered by direct intravenous injection (IVP) in any inpatient or outpatient setting by any authorized practitioner.

In general, the administering practitioner should check vital signs or other specified monitoring parameters and evaluate the patient for untoward reactions for 15 to 30 minutes following drug administration.

Acetazolamide Sodium (Diamox)
Benztropine Mesylate (Cogentin)
Bumetanide (Bumex) --- maximum of 1 mg/min up to a total of 5 mg
Cefazolin*
Ceftazidime*
Ceftriaxone*
Chlorothiazide Sodium (Diuril)
Corticotropin (ACTH) --- repository corticotropin injection should not be administered intravenously
Cosyntropin (Cortrosyn) –--- administer over two minutes
Dexamethasone Sodium Phosphate (Decadron) --- doses less than 8 mg only
Dextrose (50%)
Diazepam (Valium) --- less than or equal to 5 mg/min
Digoxin --- doses less than or equal to 0.5 mg only (maintenance dose)
Diphenhydramine HCL (Benadryl)
Droperidol (Inapsine) –--- see sedation policy, M92-9
Estrogens, Conjugated (Premarin)
Fentanyl --- bolus dosing of up to 1.1 mcg/kg over 2 minutes in healthy patients see sedation policy, M92-9
Flumazenil (Romazicon) –--- administer over 30 seconds
Furosemide (Lasix) --- maximum of 40 mg/min up to a total of 200 mg
Glucagon
Glycopyrrolate (Robinul)
Gonadorelin (Factrel)
Haloperidol (Haldol) --- use only “Haloperidol for immediate release.” Other haloperidol injections may not be given IV.
Heparin Sodium

Hydralazine (Apresoline)
Hydrocortisone Sodium Succinate (Solu-Cortef)
Hydromorphone HCL (Dilaudid)
Insulin, Regular
Iron Dextran --- less than or equal to 50 mg/min (test dose required)
Ketorolac (Toradol)
Levothyroxine Sodium (Synthroid)
Lorazepam (Ativan) --- < 1 mg/min
Mannitol
Meperidine HCL (Demerol)
Methylprednisolone sodium succinate (Solu-Medrol) ---
methylprednisolone acetate --- injection should not be administered intravenously, do not exceed 250 mg per dose.
Metoclopramide HCL (Reglan) --- doses <20 mg only
Morphine Sulfate
Muromonab –--- cd3 (Orthoclone OKT3) Administer dose over < 1 minute
Naloxone (Narcan)
Oxacillin*
Phenytoin (Dilantin) ---
- maximum of 25mg/min up to a total dose of 300 mg
- for patients in status epilepticus administration of medication may begin prior to arrival of monitoring
- additional guidelines for administration are available from Pharmacy
Piperacillin*
Prednisolone --- prednisolone acetate and prednisolone tebutate injections should not be administered intravenously
Prochlorperazine Edisylate (Compazine) --- doses <10 mg only
Promethazine HCL (Phenergan)
Protamine Sulfate
Protirelin
Rho(D) Immune Globulin (WinRho SD)
Secretin –--- administer over 1 minute
Sodium Bicarbonate –--- 8.4% solution must be diluted with at least an equal volume of normal saline prior to administration through a peripheral vein
Tolbutamide Sodium

*typically dispensed as an IV Piggyback.

Addendum B

Direct intravenous injection (IVP) of these medications requires specialized equipment, care setting, or training/certification.

- Refer to sedation policy, M92-9, when administering benzodiazepines, narcotics, barbiturates, or general anesthetics.

- Note: In some cases, an administration rate slower or faster than 3 to 5 minutes may be preferred.

Adenosine (Adenocard) --- under direct supervision of physician
Amrinone
Atropine
Calcium Chloride --- during cardiac arrest
Calcium Gluconate --- during cardiac arrest
Cimetidine (Tagamet) --- must be diluted to <u>not less than</u> 20 ml and infused over 5 minutes
<u>Cisatracurium</u>
Diazoxide (Hyperstat) --- under direct supervision of physician
Digoxin --- loading doses
Diltiazem
Doxacurium
Edrophonium (Tensilon)
Epinephrine
Esmolol (Brevibloc)
Ethacrynic Acid (Edecrin)
Etomidate --- see sedation policy, M92-9
Indocyanine Green
Fluorescein Sodium –-- Nursing Department practitioner certification required
Ketamine HCL (Ketalar) --- under direct supervision of physician
Labetalol
Lidocaine HCL (Xylocaine)
Lorazepam (Ativan)
Magnesium Sulfate
Metoprolol (Lopressor)
Midazolam (Versed) --- see sedation policy, M92-9
Mivacurium --- over at least 60 seconds
Neostigmine Methylsulfate (Prostigmin)

Pancuronium Bromide (Pavulon)
Pentobarbital Sodium
Phenobarbital Sodium --- doses up to 500 mg only
Phentolamine Mesylate (Regitine)
Phenylephrine (Neo-Synephrine) --- under direct supervision of physician
Phenytoin (Dilantin) --- greater than 25mg/min and/or a total dose of greater than 300 mg
- maximal infusion rate is 50 mg/min
- for patients in status epilepticus administration may begin prior to arrival of monitoring
- additional guidelines for administration are available from Pharmacy
Physostigmine
Phytonadione (Aquamephyton)
Procainamide (Pronestyl)
Propofol
Propranolol (Inderal)
Ranitidine (Zantac) --- must be diluted to <u>not less than</u> 20 ml and infused over 5 min
Rapacuronium
Rocuronium
Succinylcholine --- under direct supervision
Thiopental Sodium
Vecuronium
Verapamil HCL (Isoptin) --- under direct supervision of physician

Addendum C

POLICY STATEMENT FOR INJECTION OF CONTRAST MEDIA IN THE DIAGNOSTIC RADIOLOGY DEPARTMENT

The intravenous diagnostic contrast agents listed below are used in the Diagnostic Radiology Department. They may be administered by IV push or bolus injection via power injector by order of the supervising radiologist by the following members of the department:

a) a radiologist;
b) a professional nurse who has successfully completed the "Management and Techniques of IV Therapy" course and "Radiology Nursing Orientation Program" and has documented competency in the administration of IV Push Medications; or
c) a professional radiology technologist who is credentialed to practice within the Clinical Center, has successfully completed the Diagnostic Radiology Department's "IV Contrast Media" course, and has documented competency in the administration of IV contrast media.

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Intravenous Diagnostic Contrast Agents Used in Radiology

Angiovist 370 (diatrizoate meglumine and diatrozoate sodium 76%)
Angiovist 282 (diatrizoate meglumine 60%)
Feridex (ferumoxides)
Hypaque Sodium (diatrizoate sodium 25%)
Oxilan (ioxilan)
Isovue 370 (iopamidol 76%)
Isovue 300 (iopamidol 61%)
Conray 43% (iothalamate meglumine 43%)
Conray 60% (iothalamate meglumine 60%)
Renografin 76 (diatrizoate meglumine and diatrizoate sodium)
Amipaque (lyophilized metrizamide 3.75 gm)

Magnetic Resonance Imaging Contrast Agents

Magnevist (gadopentetate dimeglumine)
Prohance (gadoteridol)

Addendum D: Pediatric IV push medications

The following medications can be administered by direct intravenous injection (IVP) in any inpatient or outpatient setting by any authorized practitioner.

In general, the administering practitioner should check vital signs or other specified monitoring parameters and evaluate the patient for untoward reactions for 15 to 30 minutes following drug administration.

Acetazolamide Sodium (Diamox)
Ampicillin
Benztropine Mesylate (Cogentin)
Bumetanide (Bumex) --- maximum of 1 mg/min up to a total of 5 mg
Cefazolin*
Cefoxitin
Ceftazidime*
Ceftriaxone*
Cefuroxime
Chlorothiazide Sodium (Diuril)
Corticotropin (ACTH) --- repository corticotropin injection should not be administered intravenously
Cosyntropin (Cortrosyn) – administer over two minutes
Dexamethasone Sodium Phosphate (Decadron) --- doses less than 8 mg only
Dextrose (50%)
Diazepam (Valium) ---< 5 mg/min (refer to sedation policy, M92-9)
Digoxin --- doses < 0.5 mg only (maintenance dose)
Diphenhydramine HCL (Benadryl)
Droperidol (Inapsine)
Epoetin alfa
Estrogens, Conjugated (Premarin)
Fentanyl --- bolus dosing of up to 1.1 mcg/kg over 2 minutes in healthy patients (refer to sedation policy, M92-9)
Flumazenil (Romazicon) –--- administer over 30 seconds
Furosemide (Lasix) --- maximum of 40 mg/min up to a total of 200 mg
Glucagon
Glycopyrrolate (Robinul)
Gonadorelin (Factrel)
Haloperidol (Haldol) only “Haloperidol, for immediate release.” Other haloperidol injections may not be given IV.

Heparin Sodium
Hydralazine (Apresoline)
Hydrocortisone Sodium Succinate (Solu-Cortef)
Hydromorphone HCL (Dilaudid)
Insulin, Regular
Iron Dextran --- less than or equal to 50mg/min (test dose required)
Ketorolac (Toradol)
Levothyroxine Sodium (Synthroid)
Leucovorin
Lorazepam (Ativan) --- < 1 mg/min (refer to sedation policy, M92-9)
Mannitol
Meperidine HCL (Demerol)
Methylprednisolone Sodium Succinate (Solu-Medrol) --- methylprednisolone acetate injection should not be administered intravenously, do not exceed 250 mg per dose
Metoclopramide HCL (Reglan) --- doses < 20 mg only
Midazolam (Versed) --- direct supervision by a physician, nurse practitioner, or physician assistant is required (refer to sedation policy, M92-9)
Morphine Sulfate
Muromonab-CD3 (Orthoclone OKT3) –--- administer dose over < 1 minute
Naloxone (Narcan)
Ondansetron
Oxacillin*
Phenytoin (Dilantin) --- maximum of 25 mg/min up to a total dose of 125 mg --- (additional guidelines for administration are available from Pharmacy)
Piperacillin*
Prednisolone --- prednisolone acetate and prednisolone tebutate injections should not be administered intravenously
Prochlorperazine Edisylate (Compazine) --- doses < 10 mg only
Promethazine HCL (Phenergan)
Protamine Sulfate
Protirelin
Rho(D) Immune Globulin (WinRho SD)
Secretin – administer over one minute
Sodium Bicarbonate – 8.4% solution must be diluted with at least an equal volume of normal saline prior to administration through a peripheral rein
Tolbutamide Sodium

*typically dispensed as an IV Piggyback.

Direct intravenous injection (IVP) of the following medications requires specialized equipment, care setting, or training/certification

- Refer to sedation policy (M92-9) when administering benzodiazepines, narcotics, barbiturates, or general anesthetics.
- Note: In some cases, an administration rate slower or faster than 3 to 5 minutes may be preferred.

Adenosine (Adenocard) --- under direct supervision of physician
Albumin
Amrinone
Atropine
Bretylium
Calcium Chloride --- during cardiac arrest
Calcium Gluconate --- during cardiac arrest
Cimetidine (Tagamet) --- must be diluted to not less than 20 ml and infused over 5 minutes
Cisatracurium
Diazoxide (Hyperstat) --- under direct supervision of physician
Digoxin --- loading doses
Diltiazem
Doxacurium
Edrophonium (Tensilon)
Epinephrine
Esmolol (Brevibloc)
Ethacrynic Acid (Edecrin)
Etomidate (see sedation policy, M92-9)
Fluorescein Sodium --- Nursing Department practitioner certification required
Indocyanine Green
Ketamine HCL (Ketalar)
Labetalol
Lidocaine HCL (Xylocaine)
Lorazepam (Ativan)
Magnesium Sulfate
Metoprolol (Lopressor)
Midazolam (Versed)
Mivacurium --- over at least 60 seconds
Neostigmine Methylsulfate (Prostigmin)
Pancuronium Bromide (Pavulon)

Pentobarbital Sodium
Phenobarbital Sodium --- doses up to 500 mg only
Phentolamine Mesylate (Regitine)
Phenylephrine (Neo-Synephrine) --- under direct supervision of physician
Phenytoin (Dilantin) --- maximum of 50 mg/min up to a total dose of 250 mg ---
- for patients in status epilepticus administration may begin prior to arrival of monitoring
- additional guidelines for administration are available from Pharmacy
Physostigmine
Phytonadione (Aquamephyton)
Procainamide (Pronestyl)
Propofol
Propranolol (Inderal)
Ranitidine (Zantac) --- must be diluted to not less than 20 ml and infused over 5 min
Rocuronium
Succinylcholine --- under direct supervision
Thiopental Sodium
Vecuronium
Verapamil HCL (Isoptin) --- under direct supervision of physician