



IN THIS ISSUE

- Increase the odds that your stroke patient receives treatment cover
- Speed stroke care with simultaneous interventions 51
- Put a stop to ED visits for acute asthma exacerbations 52
- How to get hand hygiene compliance you can brag about 54
- Don't miss a pre-existing infection in your patient. 57
- What your assessment for fracture in elders *must* include 58

Statement of Financial Disclosure:
 Stacey Kusterbeck (Author), Coles McKagen (Associate Publisher), Joy Daughtery Dickinson (Senior Managing Editor), and Darlene Bradley (Nurse Planner) report no consultant, stockholder, speaker's bureau, research, or other financial relationships with companies related to this field of study.

MARCH 2010
 VOL. 13, NO. 5

Be sure *no* eligible patient misses new treatment window for stroke

Exclusion criteria is different, should be readily available

With an expanded treatment window of 4.5 hours, more of your stroke patients are eligible for treatment with tissue plasminogen activator (tPA). Minutes still count, however.

“The expanded time window allows for increased treatment opportunities,” says **Lauren Brandt**, RN, MSN, CNRN, clinical director of the Neurosciences, Brain & Spine Center at Brackenridge Hospital in Austin, TX. “However, just because there is more time now, there should be no deviation in the American Heart Association’s established times for door-to-CT or door-to-drug.”

“Also, there are additional exclusion criteria that should be readily available. These are different from the zero to three-hour time frame,” says Brandt. These include patients older than 80 years old, those with a baseline National Institutes of Health Stroke Scale score more than 25, those with a history of both stroke *and* diabetes, and those taking oral anticoagulants with an international normalized ratio (INR) less than or equal to 1.7. “So, a patient taking an oral anticoagulant is automatically excluded in the expanded time window,” says Brandt.

Is the exact time of onset of symptoms unclear? Ask what your patient was doing at that time. “One patient remembered the radio show she was listening to,” says Brandt. “By finding out the exact time of the show, the ED nurse was able to determine the time the patient was last ‘known normal.’ She did really

EXECUTIVE SUMMARY

You can increase the likelihood that your stroke patient will be eligible for treatment by identifying the time of symptom onset and performing interventions simultaneously. To improve care:

- give patients a FAQ sheet to explain why they were ineligible for treatment;
- suspect stroke with complaints of dizziness, a ground-level fall, and visual changes;
- while the patient is in CT, establish large-bore intravenous access and draw labs;
- perform a bedside swallow evaluation during the patient’s ED stay.

**EDN NOW AVAILABLE ONLINE: www.ahcmedia.com/online.html.
 Call (800) 688-2421 for details.**

well, with minimal weakness, but some expressive aphasia.”

Remember, too, that tPA is only *one* possible treatment for your patient. “Know if you have comprehensive stroke center capabilities, such as intra-arterial or mechanical embolectomy, or if there are any nearby. Also, your facility or others may be participating in a research trial for an expanded time frame,” says Brandt.

If your patient is not eligible for treatment, be ready to explain *why*. “More and more patients know there is a treatment and are upset when something isn’t done,” says Brandt. “If there are no other treatment options and the patient didn’t receive tPA, giving the patient and family an ‘FAQ’ sheet about why they weren’t eligible is helpful.” [The FAQ sheet used by ED nurses is included with the online version of this month’s *ED*

Nursing. For assistance, contact customer service at (800) 688-2421 or customerservice@ahcmedia.com.]

Minutes still count

When ED nurses at Emory University Hospital in Atlanta received a report that a stroke patient was coming in, an hour and a half was left of the treatment window for tPA. However, the patient’s transport time was almost 45 minutes. ED nurses jumped into action.

“We stopped in the ED long enough for vitals to be obtained and labs to be drawn, then went to CT,” says **Theresa Sullivan**, RN, CEN, one of the ED nurses who cared for the patient.

The patient was assessed by the ED physician on the way to CT, while the stroke page was activated. Neurology met the patient in the ED on the way back from CT while the radiologist was looking at the films. “The entire time I was watching the clock, counting down in 15-minute increments the time left on our tPA window,” says Sullivan. “As it happens, pharmacy was ready at the bedside with the tPA with about 10 minutes left in the window, when we got the CT read that this patient had a bleed and could not receive the drug. This was the closest I have ever come to losing the window.”

Here are three ways that Emory’s ED nurses cut delays in stroke care:

- **All the necessary forms are easy to grab.**

“These are kept at the nurse’s station on clipboards,” says Sullivan. “ED nurses mark down times of the EMS report, arrival of the patient, the ED physician’s arrival at the bedside, and the time the patient left for CT.”

- **Patients with a possible stroke are registered immediately at the bedside.**

“The doctor and assigned nurse are called to the room using the portable radios we all carry,” says Sullivan. “Since we work in teams, the assigned nurse’s partner and tech will also come to the room. It is a team effort to rapidly obtain vital signs and labs, including point-of-cares for INR and blood glucose.”

- **The “stroke page” alerts CT to clear a table and neurology to come to the ED for a stat evaluation.**

“*Nothing* delays getting the patient to CT. Neurology has been known to assess patients on the way to CT and on the CT table,” says Sullivan. “We even have a stretcher scale in the hallway on the way to CT, to obtain an accurate weight on the patient for tPA dosing.”

While CT is being done, pharmacy is mixing the tPA based on this weight. “If the tPA window is closing, neurology can read the CT to ensure that if tPA is not contraindicated, it can be given before it is too late,” says Sullivan. “If tPA is given, pharmacy brings it to the ED while the nurse is doing a complete neurological assessment and the partner nurse is gathering

Subscriber Information

Customer Service: (800) 688-2421 or Fax (800) 284-3291. World Wide Web: <http://www.ahcmedia.com>. E-mail: customerservice@ahcmedia.com.

Subscription rates: U.S.A., one year (12 issues), \$299. Add \$17.95 for shipping & handling. Outside U.S., add \$30 per year, total prepaid in U.S. funds. Discounts are available for group subscriptions, multiple copies, site-licenses or electronic distribution. For pricing information, call Tria Kreutzer at 404-262-5482. Missing issues will be fulfilled by customer service free of charge when contacted within 1 month of the missing issue date. Back issues, when available, are \$37 each. (GST registration number R128870672.)

Photocopying: No part of this newsletter may be reproduced in any form or incorporated into any information retrieval system without the written permission of the copyright owner. For reprint permission, please contact AHC Media LLC. Address: P.O. Box 740056, Atlanta, GA 30374. Telephone: (800) 688-2421, ext. 5491, Fax: (800) 284-3291.

ED Nursing® (ISSN# 1096-4304) is published monthly by AHC Media LLC, 3525 Piedmont Road, N.E., Six Piedmont Center, Suite 400, Atlanta, GA 30305. Telephone: (404) 262-7436. Periodicals Postage Paid at Atlanta, GA 30304 and at additional mailing offices.

POSTMASTER: Send address changes to **ED Nursing**®, P.O. Box 740059, Atlanta, GA 30374-9815.

AHC Media LLC is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center’s Commission on Accreditation.

This activity has been approved for 10 nursing contact hours using a 60-minute contact hour.

Provider approved by the California Board of Registered Nursing, Provider # 14749, for 10 Contact Hours.

This activity is authorized for nursing contact hours for 24 months following the date of publication.

ED Nursing® is intended for emergency department nurse managers, supervisors, unit managers, and quality assurance personnel.

Opinions expressed are not necessarily those of this publication. Mention of products or services does not constitute endorsement. Clinical, legal, tax, and other comments are offered for general guidance only; professional counsel should be sought for specific situations.

Editor: **Stacey Kusterbeck**.

Associate Publisher: **Coles McKagen**
(coles.mckagen@ahcmedia.com).

Director of Marketing: **Schandale Kornegay**.

Senior Managing Editor: **Joy Daughtery Dickinson**
(joy.dickinson@ahcmedia.com).

Senior Production Editor: **Nancy McCreary**.

Copyright © 2010 by AHC Media LLC. **ED Nursing**® is a registered trademark of AHC Media LLC. The trademark **ED Nursing**® is used herein under license. All rights reserved.

Editorial Questions

For questions or comments, call **Joy Daughtery Dickinson** at (229) 551-9195.



SOURCES

For more information on improving care of stroke patients in the ED, contact:

- **Theresa Edison**, RN, BSN, Emergency Department, Saint Francis Memorial Hospital, San Francisco. Phone: (415) 353-6132. Fax: (415) 353-6298. E-mail: Theresa.Edison@chw.edu.
- **Andrew D. Harding**, RN, CEN, Emergency Department, Caritas Good Samaritan Medical Center, Brockton, MA. Phone: (508) 427-3037. Fax: (508) 427-2375. E-mail: adhardingrn@gmail.com.
- **Wayne Schmedel**, RN, Emergency Department, Providence St. Vincent Medical Center, Portland, OR. Phone: (503) 216-2361. E-mail: Wayne.Schmedel@providence.org.
- **Nadya Valdovinos**, RN, TNCC, Emergency Department, Northwestern Memorial Hospital, Chicago. E-mail: nvaldovi@nmh.org.

supplies.” (See related stories on reducing treatment delays, below, and performing a bedside swallow evaluation, p. 52.) ■

Simultaneous actions speed stroke care

If a patient presents to the ED with *any* symptoms that might be caused by a stroke, ED nurses at Providence St. Vincent Medical Center in Portland, OR, immediately grab a “stroke packet.”

“It is brought to the bedside, and the nurse starts the stroke assessment,” says **Wayne Schmedel**, RN, an ED nurse at the hospital. The packet contains the National Institutes of Health (NIH) Stroke Scale, a bedside swallow evaluation, and the physician order set for stroke care. **(The contents of the ED’s stroke packet are included with the online version of this month’s ED Nursing.)**

Here are the steps that occur immediately, with many of the interventions done simultaneously:

- The NIH Stroke Scale score is obtained.
- Two intravenous (IV) lines are started.
- The ED physician is notified so a “CT brain attack” can be ordered. “The rapid CT of the brain allows for the team to determine if the presentation is based on an ischemic event versus a hemorrhagic

event,” says Schmedel. “After the CT scan, if the stroke is an ischemic event, the ED physician calls the stroke team for immediate consultation. The ED nurse prepares the patient for the possibility of administering tissue plasminogen activator [tPA].

ED nurses now look for *any* possibility that the patient’s presentation to the ED might be due to a stroke, including complaints of dizziness, a ground-level fall, and visual changes.

“Raising the bar of suspicion of stroke as a potential etiology has improved our stroke care times and reduced any delays to treatment,” says Schmedel.

Reduce treatment delays

At Saint Francis Memorial Hospital in San Francisco, as soon as ED nurses are alerted that a patient is coming in with stroke-like symptoms, they activate the stroke response team.

“This frees up our CT scanner and lab,” says **Theresa Edison**, RN, BSN, director of emergency nursing, “As soon as the patient gets here, we are at the bedside ready to do our assessments. We get them to the CT scanner within 30 minutes, and everything starts rolling after that.”

Andrew D. Harding, RN, CEN, an ED clinical nurse specialist at Caritas Good Samaritan Medical Center, Brockton, MA, says that the ED triage nurse is in “a unique position to affect the speed at which the patient receives care.”

“We have found that the best way to reduce times was to implement, at code stroke, very defined role descriptions for nurses, doctors, unit coordinators, and nurses aides,” Harding explains. “This allows for all efforts to occur simultaneously.” For example, while the patient is in CT, the ED nurse establishes large bore IV access and draws labs.

Prepare for tPA

Harding says after the CT is complete and the patient returns to the ED, he or she needs an EKG, NIH Stroke Scale assessment, complete laboratory tests, a medical history including recent surgeries and medications, and an expert consultation prior to deciding to administer tPA.

ED nurses use a checklist to ensure all these interventions are done. Meanwhile, the patient is placed on a monitor, on oxygen, and in a hospital gown, Harding says.

Nadya Valdovinos, RN, TNCC, an ED nurse at Northwestern Memorial Hospital in Chicago, says having a stroke team has been “dramatically helpful in our department.” When ED nurses call a stroke code, the

CLINICAL TIP

Bedside swallow is critical step

Nurses at Providence St. Vincent Medical Center in Portland, OR, perform a bedside swallow evaluation for all stroke patients during the patient's ED stay.

"This gives you great information on how the patient will do on their current dietary plan, as well as what medications they can safely swallow," says **Wayne Schmedel**, RN, an ED nurse at the hospital. ■

neurology team is automatically paged. **[The ED's protocols for stroke and dispensing tPA are included with the online version of this month's *ED Nursing*.]**

"The team starts their evaluation right away to determine an accurate and immediate plan of care for the patient," Valdovinos says. "Our ED nurses know that once the patient arrives, the patient will need two IVs, a blood sugar check, and a stat head CT. Nurses work proactively and simultaneously to get these tasks done. That makes a huge difference in the time of care and the patient's outcome." ■

Make immediate changes to stop ED asthma visits

Provide specific instructions

If your patient tells you he's had asthma since he was a teenager, don't assume that he must already know how to self-manage his condition. In fact, the Asthma Insight and Management (AIM) survey of 2,500 asthma patients reveals that 47% have very poorly controlled asthma.¹ (*Editor's note: To view key study findings, go to: www.TakingAIMatAsthma.com. Click on "Health-care Professional," and "Executive Summary."*)

"One of the take home messages, which is very alarming, is that in 10 years, there has really not been much progress in terms of reducing ED visits," says **Robert A. Nathan**, MD, one of the survey's researchers and a clinical professor of medicine at the University of

Colorado Health Sciences Center in Denver. "Clearly, most patients are *not* compliant. This is the reason why we have not made good inroads in reducing ED visits and hospitalizations."

The AIM survey's findings underscore that ED nurses are "the first line of defense for future exacerbations," he says. However, discharge education sometimes is skipped.

Hillary Mitchell, RN, clinical coordinator for the ED at Methodist Hospital of Sacramento, says, "We are in such a crunch most of the time that education flies by the wayside. We simply move on to the next critical patient. Most ED components to a chart do not require anything other than a check box that the patient verbalized understanding and 'off they go.'" Here are practice changes to make, based on the AIM survey's findings:

- **Find out if patients are overusing quick-relief inhalers.**

Sixteen percent of patients reported using their quick-relief inhaler daily, while an additional 7% use it three to six times a week. Nathan suggests telling patients, "Today, we are giving you steroids to get you through this attack, but you really need to get on your controller drug and take it consistently. You *cannot* be reliant on your rescue medications."

- **Use words that patients understand.**

"One thing that came up loud and clear was a problem with terminology. Patients don't know the term 'asthma exacerbation.' To the patient, it's a 'flare-up,'" says Nathan.

- **Show patients how to use an inhaler properly.**

Take this step even if you think the patient already has been told. "Repetition is so important. Patients may learn in pieces," says Nathan.

- **Calm the patient.**

One in five asthma patients said they live in fear of hospitalizations or emergency department visits. Nathan says to tell your patient, "Asthma is a controllable disease

EXECUTIVE SUMMARY

Almost half of asthma patients (47%) are noncompliant with self-management of their condition, which is one reason ED visits for exacerbations haven't decreased much in the past 10 years, says the Asthma Insight and Management study. To improve their care:

- ask if patients are overusing quick-relief inhalers;
- explain the importance of taking controller drugs;
- show patients how to use inhalers, even if they already were told.

SOURCE

For more information on improving care of asthma patients in the ED, contact:

- **Hillary R. Mitchell**, RN, BSN, CEN, Clinical Coordinator, Emergency Department, Methodist Hospital of Sacramento (CA). Phone: (916) 423-5933. E-mail: Hillary.Mitchell@chw.edu.

today with the medications that we have. But if you are only taking these 20% of the time, how can you expect your asthma to be controlled? The solution is *not* to keep taking rescue medication over and over.” (Also see stories on reducing treatment delays, below, and avoiding intubation, right.) ■

Asthma patients shouldn't wait for their meds

After your asthma patient is stabilized, promptly administer medications such as corticosteroids and antibiotics, says **Hillary Mitchell**, RN, clinical coordinator for the ED at Methodist Hospital of Sacramento.

“Other immediate interventions include bronchodilator therapy and corticosteroid therapy,” she says.

Here are three ways to reduce treatment delays:

- **Focus on the entire plan of care, including medications.**

“Acute asthma patients may present in such duress that airway management remains the focus of the ED nurse,” says Mitchell. “After the initial resuscitation of the patient, the resources available decrease. This leaves *one* ED nurse to complete the tasks and assessments ordered, often causing a delay in the patient receiving the ordered medications.”

- **Review the medications ordered by the ED physician.**

“Delays may be caused as a result of medications being inadvertently omitted from the medication regime ordered by the provider,” says Mitchell. If you see that steroids weren't ordered, for example, then recommend that the need for these be reviewed.

- **Don't delay administration.**

Since many asthma patients are children, there is often a tendency for ED nurses to stay at the bedside until the patient has “turned the corner,” says Mitchell. “This ‘medical parenting’ delays the administration of medications such as prednisolone or dexamethasone.” ■

Avoid intubation with quick actions

Work as a team

Even though he was extremely short of breath with retractions, a 53-year-old man with a history of chronic obstructive pulmonary disease and asthma managed to tell ED nurses at Methodist Hospital of Sacramento that his worst fear was being intubated.

Quick interventions by ED nurses prevented this from occurring. Here is what they did:

1. **Even before the man was moved from the EMS gurney to the ED gurney, the team of ED nurses was hard at work.**

“We talked the patient through the course of interventions we were going to begin implementing while waiting for the physician,” says **Hillary Mitchell**, RN, clinical coordinator for the ED.

2. **The patient was placed on a telemetry monitor, a blood pressure cuff and a pulse oximetry monitor.**

3. **The patient's nebulizer treatment mask was replaced with a nasal cannula.**

4. **An intravenous (IV) saline lock was started.**

5. **The patient's respiratory status was assessed.**

A decision was made that he was in need of immediate intervention from the physician, who was summoned to the bedside.

6. **A nebulizer treatment was ordered.**

“One of the ED nurses made the decision to administer the treatment, rather than make the call to the respiratory therapist for the treatment,” says Mitchell.

The provider also ordered methylprednisolone, IV fluids, an EKG, and an additional continuous nebulizer treatment. “At this point, the patient was breathing much easier. He was able to verbalize that he felt better,” says Mitchell. “He was still breathing rapidly but was less distressed. The team of three nurses accomplished in 10 minutes what would have taken one nurse 30 minutes to do. Intubation was avoided. And as we all know, intubated asthma/COPD patients are some of the hardest to wean off the ventilator.”

Prevent future visits

The man was discharged from the ED with a regimen of prednisone and a refill of his albuterol. He was instructed to follow up with his primary care physician or return to the ED as needed.

“This was a great outcome for a patient due to excellent nursing assessment and intervention,” says Mitchell.

“Quick thinking and anticipation of physician’s orders were what helped this patient avoid intubation and possibly other life-changing experiences.”

The ED nurse carefully reviewed the patient’s medications, both the ones he already was taking and those that were newly prescribed. “She also took the opportunity to explain why the patient must be aware of his own demise prior to it getting so bad that EMS must be initiated,” says Mitchell. “She discussed signs and symptoms and cues the patient may look for to trigger his need for an ED visit. This was key for this patient. He was so happy to be discharged that the nurse’s teaching was really taken to heart.” ■

Don’t get complacent with hand hygiene

(Editor’s note: This is the second of a two-part series on prevention of hospital-acquired infections in the ED. This month, we give strategies to improve compliance with hand hygiene, tips for cleaning the equipment you use and tell you how to determine if your patient has arrived at the ED with an infection. Last month, we covered avoiding infections when invasive procedures are performed, reducing the risk of infection with peripheral IV insertion, using alternatives to invasive procedures, giving central-line education to ED nurses, and decreasing the use of central lines and urinary catheters.)

No matter how many hand hygiene signs you have posted in your ED, it might not be enough to ensure ED nurses wash their hands before and after every patient and use personal protective equipment (PPE) appropriately.

“ED nurses in particular can become complacent in this very important practice,” warns **Erin Aston, RN, BSN**, an emergency nurse in the children’s ED at WakeMed in Raleigh, NC. “The emergency nurse is pulled from one room to the next due to the urgent problems of their patients. Turnover is continuous.”

This practice is particularly dangerous for some ED patients. “Immunocompromised patients are not uncommon. Care of these patients requires extra hand washing and PPE technique,” she says.

Alexandra Penzias, RN, MEd, MSN, CEN, clinical nurse educator for the Department of Emergency Medicine at Tufts Medical Center in Boston, says ED nurses are at high risk for taking shortcuts with hand hygiene due to “the unpredictability of the environment, competing demands, and the increased acuity

ED nurses are at higher risk for hand hygiene non-compliance than other units because of continuous turnover, and this noncompliance is particularly dangerous for immunocompromised patients. To improve compliance:

- place dispensers inside *and* outside of each patient room;
- perform covert observations;
- remind patients to ask about hand washing;
- speak up if you see noncompliance.

of the patient populations that we see.” Here are three ways to reduce hand washing failures:

1. Place dispensers in strategic locations.

At Tufts Medical Center’s ED, these were placed in hallways, waiting areas, by doors leading into and out of the ED, and inside and outside of each patient room.

“Patients find it reassuring to see staff practicing good hand hygiene,” says Penzias. “We also have them by each of our desktops. Many practitioners pass through the ED and use the computers, so it is important to cleanse hands before and after documenting.”

2. Prohibit artificial nails.

Penzias informed her ED nurses at staff meetings and by e-mail that artificial nails could harbor *Candida*, *Pseudomonas*, and methicillin-resistant *Staphylococcus aureus*, which then could be passed from patient to patient, or to their own families. “We encountered little resistance once the rationale was shared with staff,” she says.

3. Perform audits.

At AtlantiCare Regional Medical Center City Campus in Atlantic City, NJ, “safety champions” in the ED work with the infection control department to conduct routine hand hygiene audits of hand washing practices. “Data from the audits is tracked and trended,” reports **Stephen R. Francz, RN, BSN**, clinical manager of the ED.

At Signature Healthcare Brockton (MA) Hospital, hand washing audits compared compliance for physicians, nurses, and ED technicians. “It is important to involve staff in these audits, because often seeing is believing. Staff were more likely to evaluate their own practice if they thought they might be audited,” says **Kate MacKinnon, RN, CEN**, nurse manager for emergency services. “Outliers to the process are provided with a percentage number that shows how many times they were observed washing their hands.” (See **related stories on changes made by one ED to improve compliance, p. 55, what to say if you see noncompliance,**

SOURCES

For more information on improving hand hygiene compliance, contact:

- **Erin Aston**, RN, BSN, Children's Emergency Department, WakeMed, Raleigh, NC. E-mail: Easton@wakemed.org.
- **Elizabeth Henderson**, RN, BSN, MS, Emergency Department, Massachusetts General Hospital, Boston. Phone: (781) 706-7517. E-mail: ehenderson@verizon.net.
- **Kate MacKinnon**, RN, CEN, Nurse Manager, Emergency Services, Signature Healthcare Brockton (MA) Hospital. Phone: (508) 941-7405. Fax: (508) 941-7475. E-mail: KMackKinnon@signature-healthcare.org.
- **Linda E. Reetz**, RN, BSN, Director of Emergency Services, Beaumont Hospital, Royal Oak, MI. Phone: (248) 898-6260. E-mail: lreetz@beaumont-hospitals.com.

below right, and how to make clean gloves easily accessible, p. 56.) ■

ED makes changes to achieve compliance

Some strategies worked better than others

No ED nurse would argue that hand hygiene isn't important. It also might seem like an easy thing to accomplish.

"But, most of us can't boast favorable compliance rates," says **Linda Reetz**, RN, BSN, director of the Emergency Center at Beaumont Hospital in Royal Oak, MI. "Due to the nature of the service provided and the urgency of the care, the Emergency Center poses even more challenges in compliance than some other units." Here are changes that were made by Beaumont's ED nurses:

- **Education was provided, and signs were posted, to remind staff to practice hand hygiene.**

These efforts were only "marginally successful," says Reetz. "And with the public becoming more aware of the need for meticulous hand hygiene, we really needed to step up our efforts."

- **Signs were posted stating, "It's OK to ask me if I washed my hands."**

Although only a few ED patients have asked this question, nurses were armed with these possible responses: "Thank you for asking. I did wash my hands prior to entering your treatment bay," or "Thank you for taking an active role in your care. I plan to wash my hands right now."

"We stress that *we* are the ones inviting our patients to ask about our hand hygiene. Thus, we cannot get angry when they take us up on this offer," says Reetz.

- **Covert observations are done to identify compliance rates, which are posted monthly.**

"We chose two staff members whose identity was kept from the staff," says Reetz. ED nurses are observed not only for hand hygiene before and after patient contact, but also whether it was done in compliance with established standards and whether gloves were used when indicated.

- **The number of hand hygiene stations was increased, with units placed inside and outside patient rooms.**

"This has served to *double* our compliance rates. We took this one step further, by placing hand hygiene stations in our public waiting areas for visitors to use," says Reetz.

The covert observations had revealed that the ED nurses were most noncompliant next to higher-acuity beds and in the trauma room. "We decided that making hand hygiene stations or supplies more accessible in these areas would really make an impact in our compliance," says Reetz. "Thus, we placed dispensers on the walls in these areas when possible. We provided bottles of hand sanitizer in the room when the physical environment wouldn't house a wall dispenser." ■

See unwashed hands? You should speak up

What is the single best way to create a "zero-tolerance" culture for hospital-acquired infections in your ED? Peer accountability, according to **Elizabeth Henderson**, RN, BSN, MS, an ED nurse at Massachusetts General Hospital in Boston.

It's not enough to be vigilant in adhering to proper hand hygiene, making sure to disinfect before and after every patient contact, says Henderson. You must be sure your peers also do so.

"Don't remain silent when you observe improper techniques," says Henderson. "Do not be afraid to confront other nurses and members of the health care team when such practices are not followed."

Erin Aston, RN, BSN, an emergency nurse in the

children's ED at WakeMed in Raleigh, NC, says you must "hold co-workers accountable for their hand washing techniques, or lack thereof. Don't be afraid to speak up when protocols are not being followed."

At Beaumont Hospital in Royal Oak, MI, feedback between ED nurses was "much more effective" than education given at staff meetings, reports **Linda Reetz**, RN, BSN, director of the Emergency Center. "Through informal coaching, we introduced communication techniques and scripting that could be used to address colleagues who needed to be reminded about hand washing," she says. ■

Your hands may be clean, but is equipment dirty?

It's ultimately your responsibility

You discharge a patient, sit down to document, then an emergent patient is placed in that same room. This begs the question, "Who cleaned this room and equipment?"

"The nurse still might be documenting on the patient that previously occupied the room. Sometimes, they have no control over an emergent patient being placed in that room where possibly the equipment was not disinfected," says **Erin Aston**, RN, BSN, an emergency nurse in the children's ED at WakeMed in Raleigh, NC.

Or a patient might be rushed back to the patient care area at a time when no beds are available. "In this type of situation, a patient needing minor care may be moved to a triage room or a hallway stretcher," says Aston. "Protocols for cleaning equipment need to be in place in order for staff to know what equipment is clean or dirty. We care for multiple patients, suffering from minor illnesses to acute traumas. Our responsibilities can range from cleaning the stretcher and IV pump to saving a patient's life."

You might clean your hands before and after each patient contact, but what about your equipment?

Elizabeth Henderson, RN, BSN, MS, an ED nurse at Massachusetts General Hospital in Boston, says, "Unfortunately, this is *not* always the practice. EDs are stocked with a wide variety of equipment that unfortunately is not properly cleaned, or sometimes not even cleaned at all, in between uses."

There are often "territory wars" between clinicians and housekeeping staff over whose responsibility it is to clean equipment, adds Henderson. "Ultimately, it is the clinician's responsibility that is caring for the patient," she says. Henderson says to follow these steps:

- **Wipe counters with an antibacterial solution.** "Cables and wires should be wiped off and free from blood or any surface contaminants," says Henderson.

- **Clean pieces of equipment used by all nurses, such as stethoscopes, otoscopes, and blood pressure cuffs, in between patient uses.** "Studies have shown that micro-organisms such as methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant *Enterococci* have been cultured from these devices," says Henderson.

- **Wipe computer keyboards and mice at least once per shift with the proper disinfectant.**

- **Learn about the cleaning and disinfecting products used.**

Henderson says you should read the manufacturer's instructions beforehand, to see what type of surfaces it is used on, such as porous vs. nonporous. Also, most commercial bleach wipes need to be allowed to dry for at least one minute on the surface. "Knowledge of the proper type of product, as well as its proper usage, is the responsibility of every practitioner," says Henderson. ■

CLINICAL TIP

Put clean gloves 'at arm's length'

Starting intravenous lines, drawing blood, processing of point-of-care tests, changing stretcher linens between patients, and wiping down equipment between patients are *all* procedures that might expose you to bodily fluids. Chances are, though, you don't wear clean gloves each and every time.

To address this, boxes of gloves in every size — small, medium, and large — conveniently are placed "at arm's length for use in patient care," says **Alexandra Penzias**, RN, MEd, MSN, CEN, clinical nurse educator for the Department of Emergency Medicine at Tufts Medical Center in Boston. "Clean gloves are available in each of the patient rooms, on the supply and procedure carts, in our point-of-care lab, and in our utility rooms."

ED technicians ensure that these are stocked in all sizes, and ED nurse managers perform ongoing surveillance "to ensure that staff are utilizing gloves as appropriate, to prevent hospital-acquired infections," says Penzias. ■

Did your ED patient arrive *with* an infection?

If a patient comes to your ED with a pre-existing infection that goes unnoticed, the insurer likely will refuse to pay for treatment because it will presume wrongly that the condition was acquired in the hospital.

“We are aware that insurers, Medicaid, and Medicare will refuse to pay for the treatment of infections, if thought to be hospital-acquired,” says **Cynthia Horn**, BSN, ANM, CEN, an ED nurse at Singing River Hospital in Pascagoula, MS. (For more information on this topic, see “Is infection ‘present on admission’ in your ED?” *ED Nursing*, May 2009, p. 77.)

However, ED nurses face unique challenges in obtaining this information, compared to other hospital units. “Some patients aren’t able to provide a detailed history upon their arrival. They may be too stressed to give an accurate history, aren’t knowledgeable about their own history, or be otherwise incapacitated and unable to answer,” says **Kate MacKinnon**, RN, CEN, nurse manager for emergency services at Signature Healthcare Brockton (MA) Hospital.

ED nurses at The University of Kansas Hospital in Kansas City screen each patient on arrival for a normal skin assessment, looking for breakdown or any wounds that might be present. “We are trying hard to identify wounds that are present prior to arrival, as these are CMS [Centers for Medicare & Medicaid Services] ‘never events,’ and do the appropriate documentation for them,” says **Brian W. Selig**, RN, BSN, MHA, CEN, NE-BC, ED nurse manager. “This area has been challenging for us, and we continue to struggle with it in many cases. But we believe we are improving.” To identify pre-existing infections in your ED, take these steps:

- Ask all patients about known exposure to methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant *Enterococci*, *Clostridium difficile*,

EXECUTIVE SUMMARY

Use your patient’s history and assessment to determine whether a pre-existing infection is present, to avoid inappropriate denial of payment from insurers presuming the condition was hospital-acquired. To avoid missing these:

- perform a skin assessment on all patients;
- ask patients about known exposures;
- document, measure, and photograph skin breakdowns.

SOURCES

For more information on identifying ED patients with pre-existing infections, contact:

- **Cynthia Horn**, BSN, ANM, CEN, Emergency Services, Singing River Hospital, Pascagoula, MS. Phone: (228) 809-5154. Fax: (228) 809-5052. E-mail: Cynthia.Horn@mysrhs.com.
- **Brian W. Selig**, RN, BSN, MHA, CEN, NE-BC, Nurse Manager, Emergency Department, The University of Kansas Hospital, Kansas City. Phone: (913) 588-6506. E-mail: BSelig@kumc.edu.

or extended-spectrum beta lactamase.

Also ask whether he or she had a positive tuberculosis skin test. “When at all possible, involve a family member in this interview process, especially if they are a caretaker of the patient,” says MacKinnon. “Patients may have needs that require urgent or emergent attention, such as intubation. This makes it challenging to conduct a triage interview.”

- **Inform others about the need for precautions.**

Ancillary services such as radiology and transport might not see a sign on the door because they aren’t at the bedside. Also make housekeepers aware. “They are informed when the patient is discharged or admitted and begin intensive ‘precautions cleaning’ of that room,” says MacKinnon. “Communication is key to preventing the spread of infection.”

- **Develop a policy.**

Singing River’s ED nurses comply with their hospital’s policy to document, measure, and photograph all skin breakdowns. “We have been instructed to obtain urine samples, urine cultures, blood cultures, wound cultures, and to photograph wounds as the situation warrants,” says Horn. (See related stories on what to document, below, and assessing for skin breakdown, p. 58.) ■

Suspect infection? Then document this

Do you suspect that your ED patient might have a pre-existing infection? If so, “It’s very important to give a thorough report to the accepting nurse and document the report,” says **Cynthia Horn**, BSN, ANM, CEN, an ED nurse at Singing River Hospital in Pascagoula, MS. Horn advises documenting these items:

CLINICAL TIP

Check heels for skin breakdown

Take a quick look at your patient's heels when they are wheeled into triage, says **Cynthia Horn**, BSN, ANM, CEN, an ED nurse at Singing River Hospital in Pascagoula, MS.

"It's impossible to do a total body assessment for wounds in triage, but the heels will give you some good information about skin breakdown."

"The family usually brings them in with slippers or socks on in place of shoes," explains Horn. "It only takes a second to slip a sock down or remove slippers. If you see skin breakdown to the heels, there is a very good change that they also have breakdown in other areas." ■

- the size and location of wounds, and whether or not there is an odor;
- the color, odor, amount, and consistency of the patient's urine;
- the presence of cough and whether it is productive or nonproductive;
- the color and texture of sputum;
- the patient's home medications, as they might already have started treatment for an infection;
- any abnormal findings.

"Make sure the pertinent lab tests have been ordered by the physician prior to admitted," says Horn. "If a patient comes in with fever, do not admit them without a chest X-ray, even if you are sure the patient has a urinary infection." ■

Don't miss underlying reason for elder's fall

Perform a functional assessment

Fractures were the most common injury (41%) of more than 2 million elders coming to community EDs in 2006 because of fall injuries, says a new report from the Agency for Healthcare Research and Quality (AHRQ).¹

William Spector, PhD, one of the report's authors

and a health services researcher for AHRQ, warns that your elderly patient probably has a complex medical history with many comorbidities, functional status limitations, and multiple medications. "The concern is that the elderly will get a cursory assessment and implications for caregiving will not be dealt with," he says. For this reason, Spector says you should find out this information:

• What services is your patient receiving?

"A fall injury may not only affect the patient, but the consequences may affect the helping network and social network they have," says Spector. "Your assessment needs to include a functional and social assessment, as well as a medical assessment."

• What medications is the patient taking?

"If there are additional meds, or adjustments that need to be made with meds, there are likely to be polypharmacy issues," says Spector. "Know exactly what they are taking and what complications could arise."

• What caused the fall?

"There may be underlying medical problems or environmental issues that caused the fall," says Spector.

Laura Hoban, RN, ED nurse at Scripps Mercy Hospital in San Diego, asks, "Was it a mechanical fall, or did they get dizzy or have another medical concern prior to their fall? It's very important to listen to the patient as well, as the family, to get *all* of the information about the fall. We may get the full story in bits and pieces."

A patient with hip pain might tell you that he or she took his or her insulin, then didn't get a chance to eat and felt dizzy. Or it might be that your patient doesn't remember what happened. "Then, you need to be concerned that they had a loss of consciousness," she says.

Look for abrasions, bruising, or deformities, even if your patient doesn't report pain, Hoban says. "Assess their ability to walk," she says. "Often times, that is when they'll notice the pain, which then can be explored more."

Hoban cared for a 90-year old female who reported significant hip pain when nurses attempted to ambulate her. "After X-rays were completed and no fracture was found, it was determined that she still needed to be hospitalized because of her inability to walk due to pain," she recalls. "She was relieved, as she didn't know how she was going to care for herself."

EXECUTIVE SUMMARY

If your elderly patient reports a fall injury, carefully assess for fractures and identify what caused the fall. To improve care:

- suspect loss of consciousness;
- assess the ability to walk;
- look for abrasions, bruising, or deformities.

CLINICAL TIP

Ask this question about elder's fall

When elderly patients report fall injuries, ask them what they were doing prior to falling.

"You may learn that it was 5 p.m. in the evening and they were not dressed for the day," says **Laura Hoban**, RN, an ED nurse at Scripps Mercy Hospital in San Diego. "This gives you much-needed information about their situation at home, their ability to care for themselves, and whether they have easy access to help." ■

At first, the only complaint of an elderly man seen in Oakwood Hospital and Medical Center's ED was severe pain in his left hip due to a slip and fall. However, the ED nurse's assessment revealed a significantly shortened and externally rotated left leg, which indicated a hip fracture.

"Upon further assessment, the nursing staff noted multiple bruises over the chest wall at various stages of healing," says **Lori Dowell**, RN, BSN, clinical educator for the ED at Oakwood Hospital and Medical Center in Dearborn, MI. "When questioned, the patient admitted to having frequent episodes of verbal and physical abuse from his at-home caregiver. The nurses were able to effectively provide for his physical and emotional needs, while addressing his need for protection against harm." (For more information on this topic, see "Elder abuse increasing — Can you recognize it?" and "If you suspect abuse, ask these questions," both in *ED Nursing*, December 2003, p. 16 and 17, respectively. Also see related stories on a question to ask your patient, above, and treatment of fractures, above right.)

Reference

1. Owens PL, Russo CA, Spector W, et al. Emergency department visits for injurious falls among the elderly, 2006. *HCUP Statistical Brief*, No. 80. October 2009. Agency for Healthcare Research and Quality; Rockville, MD. ■

Elder with fracture? Take these steps

If an elderly patient reports a fall injury, your first priority is to ensure that the patient maintains an open airway and shows signs of adequate breathing and circulation, says **Lori Dowell**, RN, BSN, clinical educator for the ED at Oakwood Hospital and Medical Center in Dearborn, MI.

"Supplemental oxygen may be needed," she says. "Cervical spine immobilization may be required through the use of a cervical collar and backboard."

Treatment of an elderly patient's fracture might begin with proper splinting or immobilization above and below the deformity, says **Barb Smith**, RN, BSN, MSA, CEN, trauma program manager at Botsford Hospital in Farmington Hills, MI. "Make sure to check distal pulses before and after the application, to ensure there is no neurovascular compromise," she says. Next, follow these steps:

1. **Apply ice to control pain and decrease swelling.**
2. **Cover open wounds with a sterile dressing.**
3. **Anticipate the need for antibiotics.**
4. **Administer pain medications.** "Remember that the elderly may be more sensitive to narcotics," says Smith. "Close monitoring is important." ■

CNE instructions

Nurses participate in this continuing nursing education program by reading the issue, using the provided references for further research, and studying the questions at the end of the issue.

Participants should select what they believe to be the correct answers, then refer to the list of correct answers to test their knowledge. To clarify confusion surrounding any questions answered incorrectly, please consult the source material.

After completing this semester's activity with the **June** issue, you must complete the evaluation form provided in that issue and return it in the reply envelope provided in order to receive a certificate of completion. When your evaluation is received, a certificate will be mailed to you. ■

COMING IN FUTURE MONTHS

■ Immediate steps if you suspect a transient ischemic attack

■ Life-saving actions for isolating infectious patients

■ Foolproof tips to obtain venous access in children

■ Learn how your assessment of elders should differ

EDITORIAL ADVISORY BOARD

Consulting Editor: Darlene Bradley, RN, CNS, CCRN, CEN.
MICN, FAEN, Director Emergency/Trauma Services,
University of California Irvine Medical Center, Orange

James J. Augustine, MD
Director of Clinical Operations,
EMP Management
Canton, OH
Assistant Fire Chief and Medical
Director
Washington, DC, Fire EMS
Clinical Associate Professor,
Department of Emergency
Medicine
Wright State University
Dayton, OH

Kay Ball,
RN, PhD, CNOR, FAAN
Perioperative Consultant/
Educator
K&D Medical
Lewis Center, OH

Sue Dill, RN, MSN, JD
Director
Hospital Risk Management
OHIC Insurance Co.
Columbus, OH

Darlene Matsuoka, RN, BSN,
CEN, CCRN
Clinical Nurse Educator
Emergency Department
Harborview Medical Center
Seattle

Reneé Semonin Holleran
RN, PhD, CEN, CCRN, CFRN
Nurse Manager, Adult
Transport Service
Intermountain Health Care
LifeFlight
Salt Lake City

Barbara Weintraub
RN, MPH, MSN
Manager
Pediatric Emergency Services
Northwest Community Hospital
Arlington Heights, IL

CNE objectives/questions

Upon completion of this educational activity, participants should be able to:

- **identify** clinical, regulatory or social issues related to ED nursing;
 - **describe** the effects of clinical, regulatory, or social issues related to ED nursing on nursing service delivery;
 - **integrate** practical solutions to ED nursing challenges into daily practice.
9. Which is true regarding a patient's eligibility for treatment with tissue plasminogen activator (tPA) in the extended time frame between three and 4.5 hours?
 - A. The same exclusion criteria apply whether the patient is treated within three hours or within the extended time frame.
 - B. Patients more than 80 years old are possible candidates for treatment in the extended time frame.
 - C. Patient with a history of stroke *and* diabetes are not automatically excluded in the extended time frame.
 - D. Patients taking oral anticoagulants are automatically excluded in the expanded time frame.
 10. Which is recommended to prevent future ED visits for asthma exacerbations?
 - A. Always show the patient how to use an inhaler properly even if you think he or she already has been told.
 - B. Taking the time to instruct patients in the use of inhalers should only be done if the patient has *not* received this instruction previously.
 - C. Because overuse of quick-relief inhalers is uncommon, this area should not be a focus of your discharge education.
 - D. Emphasizing that patients cannot be reliant on their rescue medications has not been found to be an effective approach.
 11. Which is true regarding efforts to increase hand hygiene compliance in the ED?
 - A. EDs should avoid use of covert observations to gauge compliance.
 - B. Increasing the number of hand hygiene stations placed inside and outside patient rooms is an effective approach.
 - C. Adding additional hand washing dispensers doesn't seem to affect compliance, regardless of their location.
 - D. Encouraging patients to ask whether nurses washed their hands is counterproductive when it comes to improving compliance.
 12. Which is true regarding assessment of ED patients for pre-existing infections?
 - A. ED nurses should avoid photographing skin breakdowns noted during their assessment.
 - B. Inpatient nurses, not ED nurses, are responsible for documenting wounds present on arrival, according to the Centers for Medicare & Medicaid Services.
 - C. ED nurses should avoid involving a family member in the interview process when asking the patients about known exposure to drug-resistant organisms.
 - D. If the ED nursing assessment reveals skin breakdowns, then urine samples, urine cultures, and blood cultures should be obtained, according to hospital policy.

Answers: 9. D; 10. A; 11. B; 12. D.

To reproduce any part of this newsletter for promotional purposes, please contact:

Stephen Vance

Phone: (800) 688-2421, ext. 5511

Fax: (800) 284-3291

Email: stephen.vance@ahcmedia.com

To obtain information and pricing on group discounts, multiple copies, site-licenses, or electronic distribution please contact:

Tria Kreutzer

Phone: (800) 688-2421, ext. 5482

Fax: (800)-284-3291

Email: tria.kreutzer@ahcmedia.com

Address: AHC Media LLC
3525 Piedmont Road, Bldg. 6, Ste. 400
Atlanta, GA 30305 USA

To reproduce any part of AHC newsletters for educational purposes, please contact:

The Copyright Clearance Center for permission

Email: info@copyright.com

Website: www.copyright.com

Phone: (978) 750-8400

Fax: (978) 646-8600

Address: Copyright Clearance Center
222 Rosewood Drive
Danvers, MA 01923 USA

Understanding the Risks and Benefits of Treatment of Acute Ischemic Stroke with *tissue Plasminogen Activator (tPA)*

What is a stroke?

Stroke occurs when a blood vessel is ruptured (hemorrhagic stroke) or becomes blocked (ischemic stroke) causing a region of brain injury.

What happens in acute ischemic stroke?

In an acute ischemic stroke, the blood flow to a part of the brain is interrupted because of sudden blockage of a blood vessel. The blockage is usually due to a blood clot which starves the brain of needed oxygen and nutrients. The center of the starved area may die quickly, and the surrounding area may die slowly over hours.

What is tissue plasminogen activator or tPA?

TPA is a clot buster. The idea is to return blood flow to the region of the brain undergoing injury. If the clot is dissolved soon enough, some or all of the brain may be rescued from the threatened injury. Rescuing brain that was starved may decrease the amount of disability that results from the ischemic stroke. One research study demonstrated that, overall, patients given tPA within three hours of ischemic stroke onset had less disability three months later than patients not given any treatment.

Do all stroke patients get this treatment?

No. Specific criteria are used to identify those patients most likely to benefit and to avoid serious side effects. If a stroke patient does not fulfill all of those criteria, the risks of therapy are probably higher and the chance of benefiting probably lowers.

What are the potential benefits?

The potential benefits are related to reducing disability after recovery from stroke. According to the NINDS tPA trial, if stroke patients received tPA their chance of having little or no disability is 30% greater than those getting sugar pill (placebo) alone. Even though the chances of a good outcome are improved, *over half of the stroke patients who are given tPA will still have disability from their stroke. A good outcome is not guaranteed.*

What are the potential risks?

The major risk of tPA therapy in stroke patients is that they may bleed into the injured area of the brain, causing a worsening of their condition and even death. The chance of serious bleeding into the stroke area is less than 0.6% in stroke patients not treated with tPA versus approximately 6% in those who do get tPA. Of those who bleed after tPA, about one half will die. However, overall, death rates are unchanged at three months if you did or did not receive tPA.

Why should someone receive tPA?

It is the only FDA approved clot buster for acute ischemic stroke. It offers the best opportunity for reduction of disability after stroke in those patients who qualify.

NMH ACUTE ISCHEMIC STROKE

PROTOCOL

(Includes all acute ischemic strokes involving intra and extra cranial arteries)

Immediate Response

When a stroke patient is first identified, the following steps and procedures should be initiated as soon as possible.

- Stabilize the patient's vital functions
- Call the Acute Stroke Team (5-5555)
- Connect the patient to cardiac and respiratory monitors with alarms **on**
- Begin 2 IV lines (one in each arm, if possible)
- Send the following blood tests: complete blood counts, routine blood chemistries, PT, PTT and a drug screen on a **SUPER-STAT** basis
- If the patient may receive IV Alteplase (IV t-PA), send blood for a type and screen
- Check a blood glucose dextrostick
- Order a STAT head CT scan, without contrast
- Obtain an ECG, urinalysis and CXR (if time permits)
- Complete a screening history and physical, focusing on neurologic deficits and cardiac function, including carotid bruits
- Obtain additional history from family/friends, such as the exact time of onset, medical history and concomitant medications
- Communicate clinical situation and treatment options with the medical care team
- Alert Anesthesia service if appropriate

Imaging: Case Escalation and other considerations

Case Escalation

Definition: Escalation of case interpretation from the Senior Radiology resident in the ED to simultaneous interpretation by the Senior Radiology resident in the ED and the on-call Neuroradiology Fellow. The Neuroradiology attending serves as the back-up in all circumstances.

The following Stroke Neurology cases will be "escalated":

Stroke Code Head CT: for patients in whom IV/IA tPA or endovascular treatment is being considered

Stroke Code MR/MRA/MRP: for patients in whom IV/IA tPA or endovascular treatment is being considered

Arterial Dissection MRI/MRA and/or CTA: patients with acute neurological deficits for whom acute and significant therapeutic decisions must be made at the time of presentation

Venous Thrombosis MRI/MRA/MRV and/or CTA/CTV: patients with acute neurological deficits for whom acute and significant therapeutic decisions must be made at the time of presentation

Imaging: Case Escalation and other considerations con't

Other considerations: General agreements/definitions/tenets

Normal hours are defined as 7:30 am to 5:00pm Monday through Friday

After hours are defined as after 5:00 pm on weekdays and all day Saturday, Sunday and holidays.

A "Stroke Code Pager" will be worn at all times by the Senior Radiology Resident in the ED.

Direct consultation between the examining Neurology resident/stroke fellow and Senior Radiology resident/fellow in the ED is mandatory for all cases in which Neurology is involved. This contact, in person or on telephone (6-7038), will be initiated by the examining Neurology resident/stroke fellow.

Direct consultation between Stroke/ESN Team and Radiology Team is mandatory for all cases beyond 3 hours in which IA therapy is considered. This contact, in person or on the telephone, will be initiated by the Stroke/ESN Team.

For ED patients in whom MRI is ordered, MR compatible leads will be placed in the ED prior to transporting to MRI.

Post-IA /endovascular: therapy: Immediate, defined as within 2 hours after completion of IA therapy.

All immediate/delayed post-IA examinations are optional and under the discretion of the interventionalist/stroke neurologist.

Basic tenets guiding which scanner to use include first available followed by best available technology (slice profile, perfusion package) and will be made on a case by case basis.

Access to the full PACS application, NMH applications and voice recognition is integral to the program and will be achieved and deployed to the appropriate personnel including but not limited to all Neuroradiology attendings and Neuroradiology Fellows.

Stroke Code Imaging Protocols:

Acute Ischemic Stroke Imaging Protocol: < 3 hours

Examination: Non-contrast CT Head

Interpretation: Normal hours
CT Team

After hours
Senior Radiology resident in ED simultaneous with on-call Neuroradiology Fellow
Back-up: Neuroradiology Attending

Option(s): CTA Head/Neck, CT Perfusion

Interpretation: Normal hours
CT Team
Fxn Team

After hours
Senior Radiology resident in ED simultaneous with on-call Neuroradiology Fellow
Back-up: Neuroradiology Attending

Acute Ischemic Stroke Imaging Protocol: >3 hours

Examination(s): Non-contrast CT Head Stroke Code MRI/MRA/MRP

Interpretation: Normal hours
CT Team
MR/FxnTeams

After hours
Senior Radiology resident in ED simultaneous with on-call Neuroradiology Fellow
Back-up: Neuroradiology Attending

Option(s): Non-contrast CT Head CTA Head/Neck CTP Head

Interpretation: Normal hours
CT Team
Fxn Team

After hours
Senior Radiology resident in ED simultaneous with on-call Neuroradiology Fellow

Acute Ischemic Stroke Imaging Protocols: Post-IA therapy

Post-IA therapy: Immediate

Examination(s): Non-contrast CT Head

Interpretation: All hours
Neuroradiology/ESN fellow involved in case
Back-up: Neuroradiology Attending

Option: Stroke Code MRI/MRA/MRP

Interpretation: All hours
Neuroradiology/ESN fellow involved in case
Back-up: Neuroradiology Attending

Post-IA/Endovascular therapy: Delayed

Examination(s): Stroke Code MRI/MRA/MRP

Interpretation: Normal hours
Fxn Team

After hours
Neuroradiology/ESN fellow involved in case
Back-up: Neuroradiology Attending

Acute Ischemic Stroke Imaging Protocols: Delayed imaging

Follow-up brain imaging

Examination(s): Non-contrast CT Brain or MRI Brain

Interpretation: CT or MRI Team

Report contents: Final infarct size compared to initial estimates

Notes: Performed at 1 week or upon discharge, whichever comes first.

IV Alteplase (IV t-PA) Protocol:

Inclusion/Exclusion criteria

Inclusion Criteria

1. Diagnosis of any ischemic stroke in any circulation causing measurable, significant neurological deficit?
2. The neurological signs should not be clearing spontaneously.
3. The neurological signs should not be minor and isolated
4. Unambiguous determination of symptoms onset, or time patient last confirmed normal
5. Ability to begin IV Alteplase (IV t-PA) therapy within 3 hours of symptom onset.
6. Head CT scan without any evidence of hemorrhage, meningioma causing edema or other complicating diseases.
7. Age 18 or older*.
8. A patient with seizure at the time of onset of stroke may be eligible for treatment as long as the physician is convinced that the residual impairments are due to stroke and not a postictal phenomenon.

Absolute Contraindications

7. Any past history of intracerebral or subarachnoid hemorrhage
8. Symptoms suggestive of subarachnoid hemorrhage
9. CT (or MRI) scan showing evidence of hemorrhage, AVM, tumor (except meningioma not causing brain edema)
10. BP is greater than 185/110, or patient requires continuous IV antihypertensive medication to maintain BP less than 185/110.
11. Seizure in which the major clinical deficit is due to a postictal phenomenon. A patient with seizure at the time of onset of stroke may be eligible for treatment as long as the physician is convinced that the residual impairments are due to stroke and not a postictal phenomenon).
12. Any known intracranial or intraspinal surgery within the past 3 months
13. Any known major surgery that presents unacceptable bleeding risk in the past 14 days
14. Known major head trauma or prior stroke (New deficit lasting greater than 24 hours) in previous 3 months
15. Known myocardial infarction in previous 3 months
16. PTT > 5 seconds over ULN or INR greater than 1.7
(If not on warfarin and no suspicion of coagulopathy, may administer tPA before stat coags results available)
17. range Use of heparin within last 48 hours with PTT out of normal
(If no use of heparin and no suspicion of coagulopathy, may administer tPA before stat coags results available)

18. Use of anticoagulant dose of heparinoid, other non-heparin anticoagulant or IIB/IIIa inhibitor in last 24 hours (Enoxoparin. or other Synthetic Heparinoid; Abciximab; Eptifibatide; or other IIB/IIIa Argatroban; Rifludin; or other direct thrombin inhibitor)
19. Platelet count less than 100,000/mm³
(If no suspected thrombocytopenia, tPA may be administered before STAT platelet count available)
20. Major active internal bleeding
21. Subdural hematoma within the past six months

Relative Contraindications

If tPA is ordered despite relative contraindication, state reason that the benefits of intravenous tPA administration likely outweigh the risks:

22. Dramatic improvement or minor symptoms
23. Clear evidence or strong suspicion of active pericarditis, endocarditis, aortic dissection, septic embolus, recent or current pregnancy, inflammatory bowel disease; or other condition posing risk of uncontrollable internal bleeding
24. CT scan shows unequivocal hypodensity in greater than 1/3 cerebral hemisphere (Early infarct signs are not a contraindication)
25. Known history of internal, GI, or abnormal GU bleeding in the past 21 days
26. Non-compressible arterial puncture or known internal biopsy, in last 7 days
27. Known invasive surgical procedure within last 14 days
28. Blood glucose less than 50 or greater than 400mg/dL
29. Known active alcohol abuse or illicit drug use
33. Coma or stupor

Patients with an NIH stroke score >22, may be at increased risk for bleeding complications. However, this group of patients still benefit from TPA therapy.

Patients with hypodensity in > 1/3 of the MCA territory on the head CT scan may be at a significantly increased risk of ICH; in such cases, it may be reasonable to withhold TPA therapy.

* In elderly patients > 80 years old, IV Alteplase (IV t-PA) appears to have efficacy similar to younger patients, although there may be a slightly higher risk of ICH.

* The safety and efficacy of IV Alteplase in patients >80 years old is unclear at this time. Recent studies have shown that the risk of ICH is not substantially increased in the elderly, although this observation is based on very limited data. The use of IV Alteplase in children is unclear. There may be an increased risk of hemorrhage. Dosages of 0.5 mg/kg have been suggested. The etiologies of stroke in children include many different mechanisms, some of which may not respond to lytic therapy.

** In patients without a recent history of use of anticoagulants and no history of bleeding problems, IV Alteplase (IV t-PA) may be initiated pending PT/PTT results, but must be STOPPED should these coagulation studies be elevated.

IV t-PA Treatment Decision

- Once a decision to administer the medication has been made, Inform patient and family about risks and benefits of IV Alteplase (IV t-PA) therapy
- A formal signed informed consent is not required since this is an FDA approved therapy and it is recommended as standard of care in most stroke treatment guidelines.
- Communicate clinical situation and treatment options with the medical care team
- IV Alteplase (IV t-PA) for ischemic stroke should only be administered by Neurology house staff under orders from a Neurology Attending.

TPA Administration

Administer IV Alteplase (IV t-PA) as soon as possible. Do not delay administration for patient transfer to another unit or ward. Do not transfer patient during the infusion.

1. Dose = 0.9 mg/kg with a maximum dose of 90 mg
2. 10% as an IV bolus over 1-2 minutes; remainder IV infusion over 1 hour
3. Measure blood pressure every 15 minutes for the first 2 hours and subsequently every 30 minutes for the next 6 hours, then hourly until 24 hours after treatment
4. Perform neurological assessments every 15 minutes during infusion and every 30 minutes thereafter for the next 6 hours, then hourly until 24 hours after treatment
5. If the patient develops severe headache, acute hypertension, nausea or vomiting, discontinue infusion (if rt-PA is being administered) and obtain emergency CT scan
6. Treat BP to keep BP < 180 systolic / < 105 diastolic during and 24 hours after infusion
7. Discontinue the infusion if vital signs become unstable, neurologic status worsens or severe headache develops
8. Obtain a STAT head CT scan if the above occur
9. Rare cases of angioedema have been reported during or after IV Alteplase (IV t-PA) therapy.
10. Avoid ACE inhibitors as these may precipitate angioedema

Post-TPA Infusion Care

1. Admit the patient to the Stroke Unit or an ICU
2. Measure blood pressure every 15 minutes for the first 2 hours and subsequently every 30 minutes for the next 6 hours, then hourly until 24 hours after treatment
3. Perform neurological assessments every 15 minutes during infusion and every 30 minutes thereafter for the next 6 hours, then hourly until 24 hours after treatment
4. DO NOT ADMINISTER ANY ANTICOAGULANTS OR ANTIPLATELET AGENTS FOR 24 HOURS POST-INFUSION
5. NO ARTERIAL PUNCTURES, INVASIVE PROCEDURES, OR CATHETER PLACEMENTS FOR 12 HOURS POST-INFUSION
6. If signs of neurologic deterioration occur, obtain a STAT head CT
7. If there is evidence of severe peripheral bleeding or symptomatic ICH, infuse cryoprecipitate, 5-10 units, immediately

8. If bleeding persists, infuse Prothrombin complex concentrate (PCC, ordered as “Feiba”), PRBC and/or platelets as needed
9. Repeat head CT scan 24 hours post-infusion to evaluate for ICH

Patients who are eligible for IV tPA may be considered for endovascular therapy if the following criteria are met:

1. They have clinical signs of major stroke from large vessel occlusion
2. Imaging documents large vessel (M1, Basilar, Carotid T) occlusion.
3. Imaging may be CT, CTA, MRI, MRA or angiography.
4. Endovascular therapy can begin (defined as infusion of drug or insertion of device) within 1 hour of the decision to initiate same
5. Patient or family can consent to the treatment (telephone consent acceptable under usual NMH guidelines)
6. Patient or family understands that IV tPA is the FDA approved standard therapy; but that in the judgment of the stroke and endovascular attendings, endovascular therapy may be superior in this patient.

Endovascular protocol (mechanical and/or chemical)

Review <3 hours IA tPA criteria above
3-6 hours for full dose IA tPA
3-8 hours for mechanical treatment

Notify Anesthesia service as early as possible

Inclusion criteria:

Answer to all should be yes:

1. Acute ischemic stroke diagnosed clinically with NIHSS ≥ 8 unless aphasia, visual field deficit, or major neglect syndrome.
2. CT, CTA, MRI, MRA, or Angiogram shows large vessel occlusion
3. For anterior circulation strokes, clearly documented time of onset or time last seen normal < 8 hours
4. For “locked-in” syndrome, may consider interventions. Clearly documented time of onset or time last seen normal < 24 hours see above
5. Endovascular therapy (defined as infusion of drug or insertion of device) can begin before 8 hours for anterior circulation and distal posterior circulation stroke and within 24 hours for basilar artery occlusion
6. CT hypodensity (lucency) < 1/3 MCA territory
 - a. Include ASPECT score
7. Absent hemorrhage and midline shift on CT 0-3 hours

All the above should be yes and the patient should meet exclusion criteria for IV TPA

Relative contraindications to IA pharmacological lysis: (mechanical may still be used without lytics):

Patients with conditions listed with asterisks () should be considered for a “low dose” protocol (described below)**

1. **Use of heparin within 48 hours with PTT > 1.5x ULN
2. **Glucose < 50 mg/dl or > 400 at time of treatment. (must be corrected before therapy)
3. **History of clinical stroke in the previous 6 weeks
 - Non-Lacunar
 - Consider size and location of stroke
 - Ipsilateral large stroke (enhancing brain infarct)= OK for mechanical use- no lytics
4. **Known prior history of non-trivial intracranial bleeding.
 - a. Prior bleeding which is deemed by the treating physician as having an increased risk for further bleeding (i.e. suspected intracranial hemorrhage)
5. **CT evidence or clinical history of intracranial neoplasm except meningioma not causing brain edema
6. **Any vascular puncture
7. **Removal of central line IV in non-compressible site within 24 hours
8. Anterior circulation stroke with time of onset or time last seen normal > 8 hours
“Locked-in” syndrome with time of onset > 72 hours unless D/P imaging suggests otherwise
9. CT scan shows any acute intracranial hemorrhage.
10. Acute hypodensity on CT > 1/3 MCA territory, or revealing significant mass effect or midline shift.
11. PTT > 5 seconds over ULN or INR greater than 1.7
12. Known hemorrhagic diathesis.
13. Platelet count < 30,000
14. Severe hypertension with SBP > 185 or DBP > 110 even with continuous infusion of antihypertensive medication.
15. Dramatic improvement prior to therapy.
16. Clinical presentation suggestive of subarachnoid hemorrhage.
17. Major head trauma in the prior 90 days.
18. Active or recent major hemorrhage in the last 30 days
19. PT > 2 seconds above ULN, or PTT > 3 seconds above ULN
20. Use of **anticoagulant** dose of synthetic heparinoid, non-heparin anticoagulant, or any IIb/IIIa inhibitor, in last 24 hours.
21. High clinical suspicion of septic embolism.
22. Any intracranial or intraspinal surgery in the prior 6 weeks.
23. Arterial puncture at a noncompressible site in the previous 7 days

Relative contraindications for mechanical and chemical thrombolysis

All of the following must be answered “no” to administer intraarterial lytic drugs (including IIb/IIIa inhibitors):

1. Inability to deliver device by 8 hours from time of onset or time last seen normal in anterior circulation strokes or within 72 hours of posterior circulation unless perfusion/diffusion imaging suggests potential benefit.
2. Uncontrolled hypertension > 185/110 despite maximal continuous IV therapy.
3. Infarct >1/3 MCA distribution, and or midline shift on CT or MRI
4. Platelet count <30,000
5. Large subacute stroke

IA chemical thrombolysis Protocol:

TPA up to 20 mg
Reopro up to 5 mg
ACT 150-200

IA Chemical thrombolysis: Low dose protocol:

TPA up to 5mg
Reopro up to 2 mg
ACT 150-200

Source: Northwestern Memorial Hospital, Chicago.



BEDSIDE SWALLOW SCREEN

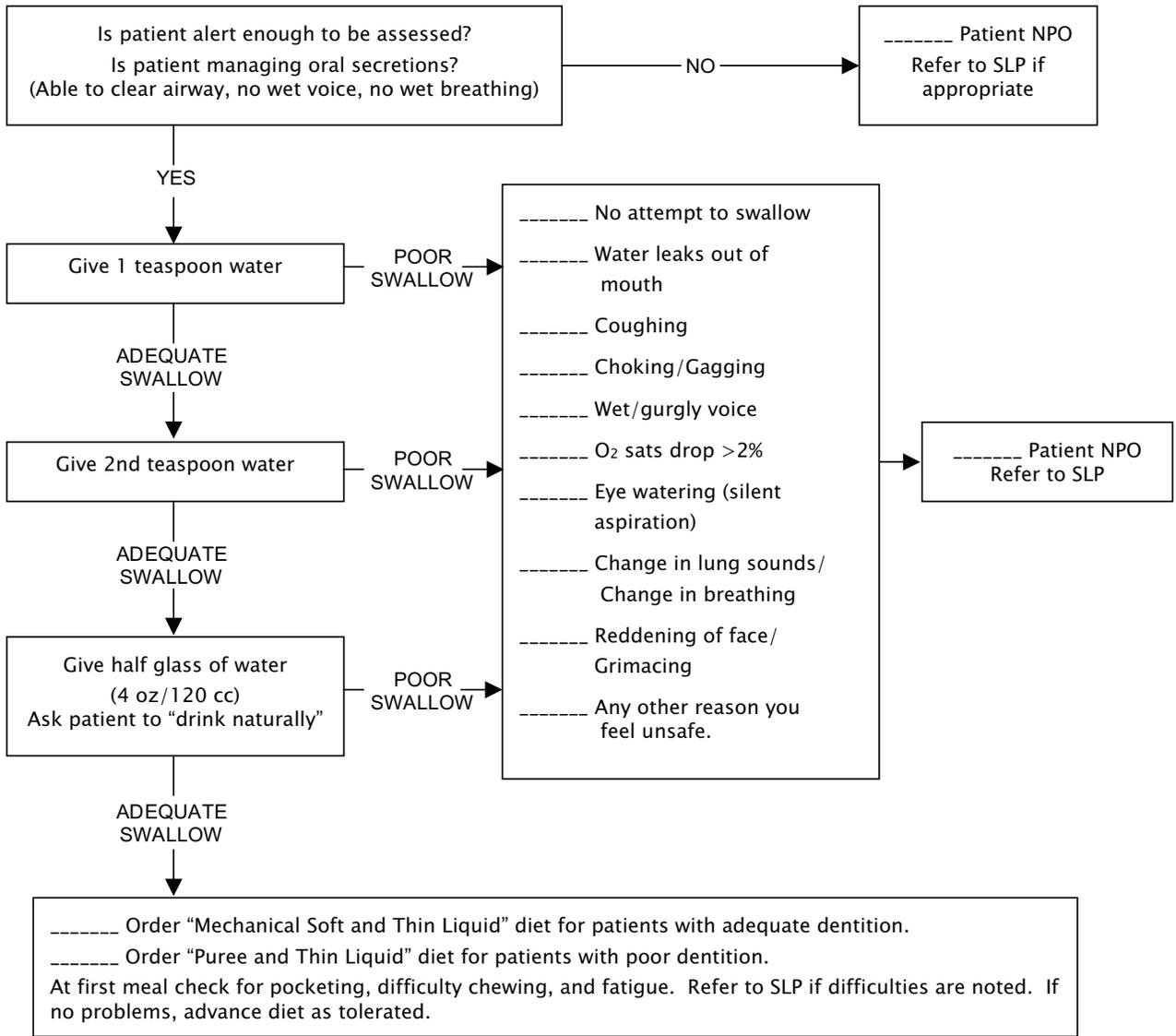
PATIENT IMPRINT

Baseline O₂ sat: _____ Monitor O₂ sat throughout screen.

Please initial the line to indicate patient's endpoint and write brief summary in Progress Notes or ED Record. When finished, place this form in the "Nursing Flow Sheet and Vitals" tab of patient chart.

Assist the patient with oral care prior to performing the swallow screen.

If diet order and/or referral to Speech-Language Pathology (SLP) is needed, please request MD to order.



RN / MD Name: _____ Date: _____ Time: _____



**PHYSICIAN'S
ORDER
RECORD**



PPMC - Providence Portland Medical Center
PSVMC - Providence St. Vincent Medical Center
PMH - Providence Milwaukie Hospital

PATIENT IMPRINT

Emergency Department Stroke/TIA/Intracranial Hemorrhage Protocol and Order Set

Note: bulleted orders are implemented unless crossed out. Orders preceded by a box (☐) receive a (✓) to initiate and blanks indicate additional information is needed.

<input type="checkbox"/> Patient <u>MAY BE</u> a candidate for acute stroke intervention: Onset less than 8 hours Time RN Goal <input checked="" type="checkbox"/> _____ 15 min Page Acute Stroke Team 503-494-9000 <p style="text-align: center;">Times: Call back _____ at bedside _____</p> <input checked="" type="checkbox"/> _____ 20 min "Brain Attack/Acute Stroke Protocol" unenhanced CT head with CTA head and neck	<input type="checkbox"/> Patient is <u>NOT</u> candidate for acute stroke intervention: Reason NOT candidate: <input type="checkbox"/> Onset greater than 8 hours <input type="checkbox"/> Symptoms too mild <input type="checkbox"/> Symptoms improving rapidly <input type="checkbox"/> Hemorrhage on CT or history of intracranial hemorrhage <input type="checkbox"/> Other: _____ <input checked="" type="checkbox"/> _____ Stat unenhanced CT head <p style="text-align: center;">Time RN</p>
--	---

- | Time | RN | Goal |
|---|-------|---|
| <input checked="" type="checkbox"/> _____ | _____ | Onset Symptoms/last time known normal |
| <input checked="" type="checkbox"/> _____ | _____ | 0 Arrival in ED |
| <input checked="" type="checkbox"/> _____ | _____ | 10 min ED physician at bedside |
| <input checked="" type="checkbox"/> _____ | _____ | Vital signs every 15 minutes if treatment candidate; otherwise ED standard |
| <input checked="" type="checkbox"/> _____ | _____ | O2 by nasal cannula to maintain O2 saturation greater than 92% |
| <input checked="" type="checkbox"/> _____ | _____ | Insert 2 IV lines (18 gauge preferred if patient is treatment candidate) |
| <input checked="" type="checkbox"/> _____ | _____ | Stat Labs: CBC, PT/INR/aPTT, Nutrition Panel Complete, troponin |
| <input checked="" type="checkbox"/> _____ | _____ | NIH Stroke Scale on admission and with any neurological change |
| <input checked="" type="checkbox"/> _____ | _____ | Bedside Blood Glucose (CBG x 1) if not available from EMS |
| <input checked="" type="checkbox"/> _____ | _____ | IV – Normal Saline @ _____ ml/hour |
| <input checked="" type="checkbox"/> _____ | _____ | Stat ECG (Do not delay CT to do ECG) |
| <input checked="" type="checkbox"/> _____ | _____ | Bedside Swallow Screen – document prior to oral intake including medications.
<input type="checkbox"/> check here if clearly unsafe to swallow; if checked, keep NPO until cleared |
| <input checked="" type="checkbox"/> _____ | _____ | Acetaminophen 650mg PO or per rectum every 4 hours as needed for temperature 37.5C or greater |
| <input type="checkbox"/> _____ | _____ | ASA 325mg PO or per rectum if head CT negative for bleed and not treating with tPA |
| <input type="checkbox"/> _____ | _____ | Place Foley only if admitting to ICU. Must wait at least 30 min after tPA infusion complete. |

Hypertension Management Guidelines on back of form

tPA dosing calculations

Patient is candidate for IV tPA (Alteplase). See inclusion/exclusion list on back.
Goal: tPA to start within 60 minutes from arrival

- Blood Pressure must be controlled less than 185/110 prior to tPA start.
- IV tPA (Alteplase) dosing: 0.9mg/kg with maximum dose 90mg.
0.9mg X _____ (weight in kg) = _____ mg total dose (Concentration: 1mg = 1ml)
- Remove from vial any quantity of drug in excess of total dose (prevents overdosing)
(100mg - _____ mg total dose = _____ mg to discard)
- IV bolus = 10% of total dose (_____ mg) Time given: _____
- Infusion dose = 90% of total dose (_____ mg) Time started: _____
via infusion pump over one hour

Physician Signature: _____ Date/Time: _____

RN Signature: _____ Date/Time: _____

RN Signature: _____ Date/Time: _____

Emergency Department Stroke/TIA/Intracranial Hemorrhage Protocol and Order Set

INTRAVENOUS tPA FOR ACUTE STROKE: ELIGIBILITY CHECKLIST

Inclusion Criteria (All YES boxes must be checked prior to treatment):

YES

- Clinical diagnosis of ischemic stroke causing a measurable neurological deficit.
- Time of symptom onset well established to be less than 180 minutes before treatment starts.

Exclusion Criteria (All NO boxes must be checked before treatment):

NO

- Evidence of intracranial hemorrhage on noncontrast head CT per radiologist or neurologist.
- High clinical suspicion of subarachnoid hemorrhage even with normal CT.
- Uncontrolled hypertension: At the time of treatment, systolic pressure >185 mm Hg or diastolic pressure remains >110 mm Hg on repeated measurements and aggressive treatment.
- Seizure at stroke onset.
- Active internal bleeding
- Current bleeding diathesis, including but not limited to:
 - Platelet count less than 100,000/millimeter cubed.
 - Recent use of anticoagulant (e.g. Warfarin sodium) and INR greater than 1.7 or Protime greater than 15 seconds.
 - Administration of heparin within 48 hours and an elevated a PTT.
- Within 3 month of intracranial surgery, serious head trauma, or previous stroke.
- History of intracranial hemorrhage, AVM, aneurysm, or neoplasm.
- Recent arterial puncture at noncompressible site.
- Pregnancy.

Relative Contraindications/Precautions

Only minor or rapidly improving stroke symptoms.
 Lumbar puncture within 48 hours.
 Major surgery of serious trauma in previous 14 days.
 Internal bleeding (GI/GU) within last 21 days.
 MI within past 3 months.
 Post-MI pericarditis.
 CBG or serum glucose less than 50mg/dL or greater than 400mg/dL.

Hypertension Management Guidelines : (Written orders needed)

<u>Ischemic Stroke</u> <u>Non tPA/intervention patient</u> Goal: SBP less than 220 and DBP less than 120 <u>tPA treatment candidate</u> Goal: Less than 185/110	<u>Intracranial Hemorrhage</u> Goal: SBP less than 160 and DBP less than 90; or MAP 110mmHg
<ul style="list-style-type: none"> • Labetolol 10 to 20mg IV over 1 to 2 minutes; may repeat x 1 • Nicardipine infusion (Cardene) 5mg/hour, titrate up by 2.5mg/hour at 5 to 15 minute intervals, maximum dose 15mg/hour ; when goal attained, reduce to 3mg/hour • Nitro paste 1 to 2 inches 	<ul style="list-style-type: none"> • Labetolol 5 to 20mg IV over 1 to 2 minutes every 15 minutes. • Nicardipine infusion (Cardene) 5mg/hour, titrate up by 2.5mg/hour at 5 to 15 minute intervals, maximum dose 15mg/hour; when goal attained, reduce to 3mg/hour. • Hydralazine 5 to 20mg IVP every 30 minutes.



2705



NIH STROKE SCALE

PSVMC - Providence St. Vincent Medical Center
 PMH - Providence Milwaukie Hospital
 PPMC - Providence Portland Medical Center
 PMMC - Providence Medford Medical Center

PATIENT IMPRINT

Category	Score/Description		Date/Time Initials				
1a. Level of Consciousness (Alert, drowsy, etc.)	0 = Alert 1 = Drowsy 2 = Stuporous 3 = Coma						
1b. LOC Questions (Month, age)	0 = Answers both correctly 1 = Answers one correctly 2 = Incorrect						
1c. LOC Commands (Open/close eyes, make fist/let go)	0 = Obeys both correctly 1 = Obeys one correctly 2 = Incorrect						
2. Best Gaze (Eyes open - patient follows examiner's finger or face)	0 = Normal 1 = Partial gaze palsy 2 = Forced deviation						
3. Visual Fields (Introduce visual stimulus/threat to pt's visual field quadrants)	0 = No visual loss 1 = Partial Hemianopia 2 = Complete Hemianopia 3 = Bilateral Hemianopia (Blind)						
4. Facial Paresis (Show teeth, raise eyebrows and squeeze eyes shut)	0 = Normal 1 = Minor 2 = Partial 3 = Complete						
5a. Motor Arm - Left 5b. Motor Arm - Right (Elevate arm to 90° if patient is sitting, 45° if supine)	0 = No drift 1 = Drift 2 = Can't resist gravity 3 = No effort against gravity 4 = No movement X = Untestable (Joint fusion or limb amp)	Left					
		Right					
6a. Motor Leg - Left 6b. Motor Leg - Right (Elevate leg 30° with patient supine)	0 = No drift 1 = Drift 2 = Can't resist gravity 3 = No effort against gravity 4 = No movement X = Untestable (Joint fusion or limb amp)	Left					
		Right					
7. Limb Ataxia (Finger-nose, heel down shin)	0 = No ataxia 1 = Present in one limb 2 = Present in two limbs						
8. Sensory (Pin prick to face, arm, trunk, and leg - compare side to side)	0 = Normal 1 = Partial loss 2 = Severe loss						
9. Best Language (Name item, describe a picture and read sentences)	0 = No aphasia 1 = Mild to moderate aphasia 2 = Severe aphasia 3 = Mute						
10. Dysarthria (Evaluate speech clarity by patient repeating listed words)	0 = Normal articulation 1 = Mild to moderate slurring of words 2 = Near to unintelligible or worse X = Intubated or other physical barrier						
11. Extinction and Inattention (Use information from prior testing to identify neglect or double simultaneous stimuli testing)	0 = No neglect 1 = Partial neglect 2 = Complete neglect						
SEDATING MEDICATIONS AFFECTING SCALE? YES / NO							
TOTAL SCORE							
INITIAL	SIGNATURE	INITIAL	SIGNATURE	INITIAL	SIGNATURE	INITIAL	SIGNATURE

159337 2/08



2705



NIH STROKE SCALE

PSVMC - Providence St. Vincent Medical Center
 PMH - Providence Milwaukie Hospital
 PPMC - Providence Portland Medical Center
 PMMC - Providence Medford Medical Center

PATIENT IMPRINT

Category	Score/Description		Date/Time Initials				
1a. Level of Consciousness (Alert, drowsy, etc.)	0 = Alert 1 = Drowsy 2 = Stuporous 3 = Coma						
1b. LOC Questions (Month, age)	0 = Answers both correctly 1 = Answers one correctly 2 = Incorrect						
1c. LOC Commands (Open/close eyes, make fist/let go)	0 = Obeys both correctly 1 = Obeys one correctly 2 = Incorrect						
2. Best Gaze (Eyes open - patient follows examiner's finger or face)	0 = Normal 1 = Partial gaze palsy 2 = Forced deviation						
3. Visual Fields (Introduce visual stimulus/threat to pt's visual field quadrants)	0 = No visual loss 1 = Partial Hemianopia 2 = Complete Hemianopia 3 = Bilateral Hemianopia (Blind)						
4. Facial Paresis (Show teeth, raise eyebrows and squeeze eyes shut)	0 = Normal 1 = Minor 2 = Partial 3 = Complete						
5a. Motor Arm - Left 5b. Motor Arm - Right (Elevate arm to 90° if patient is sitting, 45° if supine)	0 = No drift 1 = Drift 2 = Can't resist gravity 3 = No effort against gravity 4 = No movement X = Untestable (Joint fusion or limb amp)	Left					
		Right					
6a. Motor Leg - Left 6b. Motor Leg - Right (Elevate leg 30° with patient supine)	0 = No drift 1 = Drift 2 = Can't resist gravity 3 = No effort against gravity 4 = No movement X = Untestable (Joint fusion or limb amp)	Left					
		Right					
7. Limb Ataxia (Finger-nose, heel down shin)	0 = No ataxia 1 = Present in one limb 2 = Present in two limbs						
8. Sensory (Pin prick to face, arm, trunk, and leg - compare side to side)	0 = Normal 1 = Partial loss 2 = Severe loss						
9. Best Language (Name item, describe a picture and read sentences)	0 = No aphasia 1 = Mild to moderate aphasia 2 = Severe aphasia 3 = Mute						
10. Dysarthria (Evaluate speech clarity by patient repeating listed words)	0 = Normal articulation 1 = Mild to moderate slurring of words 2 = Near to unintelligible or worse X = Intubated or other physical barrier						
11. Extinction and Inattention (Use information from prior testing to identify neglect or double simultaneous stimuli testing)	0 = No neglect 1 = Partial neglect 2 = Complete neglect						
SEDATING MEDICATIONS AFFECTING SCALE? YES / NO							
TOTAL SCORE							
INITIAL	SIGNATURE	INITIAL	SIGNATURE	INITIAL	SIGNATURE	INITIAL	SIGNATURE

Source: Providence St. Vincent Medical Center, Portland, OR.