>20% increase over prior troponin levels may indicate reinfarction.

Patients with NSTEMI should receive initial treatment of 162 to 325 mg of aspirin or a loading dose of clopidogrel if they cannot tolerate aspirin. In addition, patients should receive nitrates and may require oxygen if their oxygen saturation is <90%. Patients expected to undergo early invasive therapy should receive a $P2Y_{12}$ receptor inhibitor, such as clopidogrel or ticagrelor, in addition to aspirin [Amsterdam EA et al. *Circulation.* 2014]. For patients with UA or NSTEMI who will receive conservative therapy, $P2Y_{12}$ receptor inhibition should be administered upon admission.

Clopidogrel is a prodrug that requires a 2-step process to produce the active metabolite that elicits antiplatelet activity. Some patients harbor a polymorphism in 1 of the metabolic enzymes required for this transformation, and in these patients, the benefit of clopidogrel therapy is attenuated. In contrast, ticagrelor is the active agent and does not require biotransformation.

The PLATO trial [Wallentin L et al. *N Engl J Med.* 2009] evaluated ticagrelor in >18 000 patients with ACS, with a primary end point of cardiovascular death, MI, and stroke at 12 months. Patients treated with ticagrelor experienced a lower rate of cardiovascular death, MI, and stroke, without an increase in major bleeding. However, patients with a body weight <60 kg and normal biomarker levels did not experience a benefit from ticagrelor when compared with clopidogrel. Patients in North America who received ticagrelor also did not demonstrate an improvement regarding the primary end point when compared with clopidogrel; however, it is believed that the higher aspirin dose that is administered in North America may have negated the advantage of ticagrelor.

In addition to dual antiplatelet therapy (DAPT), patients with UA or NSTEMI who are expected to undergo invasive therapy should receive glycoprotein IIb/IIIa inhibition with intravenous eptifibatide or tirofiban [Amsterdam EA et al. *Circulation.* 2014]. Anticoagulation should also be initiated. In patients who are undergoing an invasive strategy, bivalirudin, unfractionated heparin (UFH), or enoxaparin should be administered, whereas in patients who are undergoing conservative therapy, enoxaparin or fondaparinux is preferred over UFH.

An early invasive strategy is typically performed in patients with UA or NSTEMI if they are high risk according to the TIMI criteria. In the TIMACS study [Mehta SR et al. *N Engl J Med.* 2009], early vs delayed percutaneous coronary intervention (PCI) was evaluated in >3000 patients with NSTEMI with a primary outcome of death, MI, and stroke. There was no significant difference in the primary outcome among the 2 arms of the study ($P=.15$). However, early PCI was associated with a significant decrease in the secondary outcome of death, MI, and refractory ischemia (HR, 0.72; 95% CI, 0.58 to 0.89; $P=.003$). In this study, high-risk patients experienced a benefit from early PCI, but medium- to low-risk patients did not.

In conclusion, once NSTEMI is diagnosed, all patients should be treated with DAPT and anticoagulation. Beyond that, risk stratification should be performed to determine if an early invasive therapy should be initiated.

New Substances That Cause New Overdoses

Written by Phil Vinall

Mark B. Mycyk, MD, Cook County Health and Hospitals System, Chicago, Illinois, USA, advised that clinicians learn to recognize the latest trends in toxicological emergencies, identify easily missed toxicological complications, and develop a rational emergency department (ED) approach to new sources of overdose.

Several common household items have been reported to cause serious effects when taken in excess. For example, massive ingestion of soy sauce has been reported to cause hypernatremia [Carlberg DJ et al. *J Emerg Med.* 2013]. Excessive intake of Diet Coke led to seizures and hyponatremia [Mortelmans LJ et al. *Eur J Emerg Med.* 2008].

Laundry detergent pods are among the newer household items that can cause potentially serious effects [Scharman EJ. *Clin Toxicol (Phila).* 2012]. According to one study, when ingested, they can lead to gastrointestinal, neurologic, and metabolic toxicity [Smith E et al. *J Med Toxicol.* 2014]. Despite the absence of oral erythema, ulcers, or swelling, of the 3 patients who ingested laundry detergent pods, all developed some degree of esophageal injury. Another study showed that the most significant clinical characteristics of children aged ≤5 years exposed to laundry pods were vomiting and drowsiness/lethargy ($P<.001$ for both; Table 1) [Centers for Disease Control and Prevention (CDC). *MMWR Morb Mortal Wkly Rep*. 2012].

Another newer item with potential for harming children is liquid nicotine. Following reports of children overdosing on this form of nicotine used in e-cigarettes [Chatham-Stephens K et al. *MMWR Morb Mortal Wkly Rep.* 2014], pediatricians are calling for childproof packaging.

Indeed, half of all poisonings occur in children aged ≤5 years. Buprenorphine, which is taken for the

Table 1. Clinical Characteristics of Children Exposed to Laundry Pods

Clinical Characteristics	Pods, no. (%) (n = 454)	Nonpods, no. (%) (n = 414)	*P* Value
Vomiting	251 (55)	139 (34)	< .001
Coughing/choking	70 (15)	45 (11)	.048
Eye irritation/pain	51 (11)	68 (16)	.026
Red eyes/ conjunctivitis	38 (8)	36 (9)	> .05
Drowsiness/lethargy	34 (7)	9 (2)	< .001
Nausea	26 (6)	18 (4)	> .05
No effects	90 (20)	153 (37)	< .001

Adapted from Centers for Disease Control and Prevention. US Department of Health and Human Services. Health Hazards Associated with Laundry Detergent Pods—United States, May–June 2012.61(41). October 19, 2012.

treatment of opioid dependency in adults, is involved in a disproportionate number of unsupervised ingestions by children, accounting for 9.5% of all pediatric overdose admissions [CDC. *MMWR Morb Mortal Wkly Rep.* 2013]. Unintentional ingestion of buprenorphine can cause dose-dependent respiratory depression in children [Kim HK et al. *Pediatrics.* 2012].

Overall, the United States is experiencing a rising number of deaths due to overdoses of prescription opioid analgesics and cocaine [Okie S. *N Engl Med*. 2010].

Levamisole, a veterinary antiparasitic drug, has been found in up to 70% of cocaine confiscated at the US border [CDC. *MMWR Morb Mortal Wkly Rep.* 2009]. Side effects of levamisole include necrotizing vasculitis. This type of poisoning should be considered in cocaine users presenting with atypical symptoms. A thorough skin examination should be performed, and patients should be watched for development of neutropenia.

In high doses, energy supplements containing caffeine, taurine, or guarana can cause confusion, tremors, seizures, and a significant increase in blood pressure [Franks AM et al. *Ann Pharmacother*. 2012]. Dr Mycyk presented a case report of intentional caffeine overdose that resulted in severe rhabdomyolysis and acute renal failure requiring hemodialysis [Campana C et al. *Am J Emerg Med.* 2014].

Cannabinoid hyperemesis syndrome (CHS) is a type of cyclical vomiting that results from heavy marijuana use. Standard anti-emetic treatment often fails, but abstinence and hot showers (!) can be successful. Haloperidol has been shown to successfully treat CHS in a single case study [Hickey JL et al. *Am J Emerg Med*. 2013].

Dr Mycyk recommends that clinicians caring for potential overdose patients pay close attention to collateral history, consider typical and atypical toxidromes, and not rely on standard "tox screens." He recommends reading the Centers for Disease Control's *Morbidity and Mortality Weekly Report* and a weekly blog called *The Poison Review*.

Medical Care for Mass Gathering Events

Written by Maria Vinall

Planning for the delivery of emergency medical services at large-scale public events was the top of a review by Eric W. Ossmann, MD, Duke University Health System, Durham, North Carolina, USA. Dr Ossmann began by distinguishing a "mass gathering"—which is any event where a large number of people are involved in a coordinated activity—from a "mass casualty," which is defined by the number and severity of injuries.

In formulating a medical plan for a mass gathering, medical responders should always plan for the unexpected but at the same time take into consideration the type of event in calculating the potential patient presentation rate (PPR), the hospital transport rate, and even the cardiac arrest rate [Arbon P. *Prehosp Disaster Med*. 2007]. According to Dr Ossmann, the plan itself must cover threat assessment and gap identification. Medical threat assessment includes an understanding of the population baseline risk, event-specific risks (activities and the environment), and crowd size and composition (age range and known comorbidities). Gap analysis considers the positioning and availability of on-site, local, and regional equipment, facilities, and resources.

In Dr Ossmann's opinion, one of the best papers on planning for a mass gathering was based on a 1988 model developed from the study of medical incident patterns at events in large college stadiums. Medical incidents occurred at a rate of 1.20 to 5.23 per 10 000 people, with acute emergencies occurring at a rate of 0.09 to 0.31 per 10 000 people. Cardiac arrest and patient transport were much less common.

An important paper from 1991 discussed planning for a papal mass conducted during September in the US Southwest in which the heat index (about 102°F) was expected to play a major part. The plan included pre-event public education, water stations, cooling shelters, and on-site medical care. Although the majority of the individuals (about 78%) who experienced heat illness were treated on-site, about 19% were transported to off-site facilities. In general, there is a strong correlation