PERTUSSIS: The Identify, Isolate, Inform Tool Applied to a Re-emerging Respiratory Illness
California ACEP
Board of Directors & Lifeline Editors Roster

2018-19 Board of Directors
Chi Perlroth, MD, FACEP, President
Vivian Reyes, MD, FACEP, President-Elect
Vikant Gulati, MD, FACEP, Vice President
Sujal Mandavia, MD, FACEP, Treasurer
Lori Winston, MD, FACEP, Secretary
Aimee Moulin, MD, FACEP, Immediate Past President
Harrison Alter, MD, FACEP (At-Large)
Reb Close, MD, FACEP
John Coburn, MD, FACEP
Carrieann Drenten, MD, FACEP
Jorge Fernandez, MD
Michael Gertz, MD, FACEP
Doug Gibson, MD, FACEP
John Ludlow, MD, MBA, FACEP
Melanie Stanzer, DO
Mitesh Patel, MD, MBA, FACEP, FACHE, CPE
Hunter Pattison, MD (CAL/EMRA President)
Patrick Um, MD, FACEP, FAAEM

Advocacy Fellowship
Carrieann Drenten, MD, FACEP, Advocacy Fellowship Director
Sam Jeppsen, MD, Advocacy Fellow

Lifeline Medical Editor
Richard Obler, MD, FACEP, Medical Editor

Lifeline Staff Editors
Elena Lopez-Gusman, Executive Director
Kelsey McQuaid-Craig, MPA, Director of Policy and Programs
Lucia Romo, Membership and Education Coordinator
Lauren Brown, Government Affairs Associate
Meri Thresher, Administrative Assistant

JUNE 2019
Index of Advertisers

Emergency Medical Specialists of Orange County  Page 18

Independent Emergency Physicians Consortium  Page 13

Mission Hospital  Page 18

Philip Fagan, MD  Page 18

St. Jude  Page 18

Ventura Emergency Physicians  Page 18
WELCOME new members!

Aakash Amin
Michael Barbaro
John Barrett, MD
Jose Cardenas, MD
Jake Del Rosso, MD
Carlo Fernando, MD
Victoria Galea, MD
Ulysses Garcia
Jaionn Griner
William Hamrick, DO
Melanie Hartenian
Kevin Hon
Khadija Ismail, MD
Christopher Kemen
Edward Kempton, MA
Brent Kennis
Jane Lim, MD
Chase Luther, MD
Tia Mackintosh, MD
Matthew Mason, MD
Andrew Paquin
Ryan Passaro, MD
Hoang Pham, MD
Sarah Poggi, MD
Vidhi Rao
Chase Richard, MD
Brittany Sadoma
Manjinder Samra
Joshua Seidel
Alexander Stern, MD
Michael Stone, MD
Gretchen Stumhofer, MD
Kyle Vogt
Allen Yang, DO
Nadia Zuabi, MD

100% GROUPS

Central Coast Emergency Physicians
Emergency Medicine Specialists of Orange County
Emergent Medical Associates
Front Line Emergency Care Specialists
Loma Linda Emergency Physicians
Napa Valley Emergency Medical Group
Newport Emergency Medical Group, Inc at Hoag Hospital
Pacific Emergency Providers, APC
Tri-City Emergency Medical Group
University of California, Irvine Medical Center Emergency Physicians
Technology has quickly become more and more integrated into our daily lives. In the early 2000s it was revolutionary when Skype launched their software that allowed you to video call someone using your computer. Anyone remember The Jetsons? In 2010, Apple changed the game even further when they launched FaceTime, allowing you to video call people from your smartphone. Now whether it’s Facebook or Google Hangouts, the options to talk via video seem to be expanding every day.

As technology has been incorporated into our personal lives, telemedicine has become an expanding tool in the practice of medicine. Medicaid defines telemedicine as “two-way, real time interactive communication between the patient and the physician or practitioner at the distant site. This electronic communication means the use of interactive telecommunications equipment that includes, at a minimum, audio and video equipment.”

So far, research has shown mixed results for the cost savings of telemedicine. In a 2017 Health Affairs research article, Ashwood, et al found that direct-to-consumer telemedicine increases access to care but, due to its convenience, may increase utilization and health care spending. They found that 12% of telemedicine visits replace visits to other providers, while 88% of visits represented new utilization. On the other hand, research published in Telemedicine and e-Health by Vyas, et al showed that the Nemours Children’s Health System CareConnect platform decreased emergency department (ED) utilization and costs by providing parents after hours access to a physician. 2018 research by Patel, et al found that Kaiser patients who received a phone call or letter following a low-acuity ED visit decreased their utilization in the 6-months after the intervention.

While the emergency medicine telehealth research is unclear at this point, we can be certain that telemedicine is here to stay. Telemedicine has the potential to change how we provide care in the ED, whether it’s seeing a specialist for a consult (think Psychiatry or Neurology) or an emergency physician assessing a patient being transported by ambulance. Other current uses include an emergency physician providing consultation to a stand-by ED or seeing skilled nursing facility patients and avoiding preventable ED visits.

We all know there is a growing physician shortage, especially in rural areas, and access to specialists is only going to get more difficult. In Los Angeles County and some rural counties, there has been an uptick in telemedicine psychiatrist consults for this very reason. I have heard feedback from some of our members that the telepsychiatry services vary in quality but that once they find a good system, it decreases boarding times for patients on a 5150 hold. There is even literature to suggest some telepsychiatry programs field even better outcomes than in-person psychiatry visits because patients feel less inhibited to share personal information that may be difficult to reveal in an in-person visit. In 2016, Hubley, et al reviewed key telepsychiatry outcomes of 452 studies which revealed telepsychiatry is comparable to face-to-face services in reliability of clinical assessments and treatment outcomes and, in non-inferiority designs, performed as well if not better than face-to-face delivery of mental health services. In telepsychiatry studies, it is shown to be more cost-effective than face-to-face delivery of care in the majority of the studies reviewed. Furthermore, there were no published reports of adverse events in the legal realm of loss of confidentiality and limited capacity to respond to psychiatric emergencies.

Telemedicine is already impacting the practice setting and career options for emergency physicians. Many emergency medicine colleagues in different groups or practice settings are already using telemedicine as telemedicine providers, not just by consulting other specialists. Some of you may have even seen direct-to-consumer telemedicine apps that hire emergency physicians to provide phone and video appointments. As we are feeling increased pressure by CMS and hospital systems to decrease ED visits (low-acuity, ‘avoidable’, or otherwise), we need to see how we can fill in the gaps between need for care during business or after-hours and continued resource deficits in all other realms of care. We as emergency physicians can best triage and identify emergencies and urgencies, while providing care and directing appropriate follow up all hours of the day.

As a Chapter and as a College we need to be preparing for these shifts in practice settings and workforce needs. These changes are here and if we do not take the initiative to shape how they unfold, others will. We need to collect and coalesce clinical data and outcomes (and just as importantly, claims and payment data) and publish sound emergency medicine research to inform optimal and cost-effective approaches to implementing telemedicine. From here, the College needs to develop evidence-based clinical guidelines and ensure we receive fair reimbursement for our services, in the various ways they are delivered. We as emergency physicians have shown through the years a special ability to adapt to the needs of our patients and our health care delivery system. Telemedicine in emergency medicine is yet another call to arms to innovate a path to improve patient access to care and provide effective and efficient care to all of our patients far and wide.
Chapter Awards

Nominations Close June 23

14 Awards

Nominations can be submitted online

www.californiaacep.org
“As California goes, so goes the nation.” As with most things in politics, this holds true when it comes to the issue of surprise (balance) billing.

When health plans set unfair rates rather than paying for emergency services based on usual and customary charges, it puts emergency medicine providers in a tough position. Some physicians decline to enter into unfair contracts with health plans when plans refuse to negotiate adequate reimbursement. This means that some patients may be “out-of-network” when they seek services in the emergency department (ED). And when health plans do not pay non-contracted providers fairly, physicians are forced to bill patients for the unpaid balances.

In the 2009 case Prospect v Northridge, the California Supreme Court ruled an implied contract between physicians providing emergency services and care and health plans governed by the Knox-Keene Act. As a result of that implied contract, physicians must accept payment from health plans, whatever the amount, and are barred from billing patients for any additional amount.

California ACEP strongly believes that patients should not be stuck in payment disputes between out-of-network providers and health plans and insurers. We have long held, dating back to SB 981 (Perata, 2008) that an interim payment standard and a mandatory independent dispute resolution process (IDRP) are necessary to ensure fair contracting, patients are removed from billing disputes, and that payers and providers are able to fairly dispute non-contracted claims. Simply put, a balance billing ban must be coupled with a fair payment mechanism or health plans and insurers will be able to pay whatever they want without any recourse for appeal by physicians.

Emergency physicians are required by law to provide care to every patient who comes to the ER and therefore, unlike other physicians, they cannot opt out of providing out-of-network care if they are unable to agree on a contract with the health plan or insurer. They have no ability to avoid this situation.

In 2015 Assembly Member Bonta introduced AB 533. AB 533 would have banned balance billing when a patient sees an out-of-network physician at an in-network facility. As introduced, the bill did nothing to address the issue of fair payment for physicians, it simply banned balance billing. A 2017 study by Pao, et al., conducted after the Supreme Court ruling in Prospect, found that when you ban balance billing without providing a mechanism to ensure fair payment of physicians, contract rates decline and reimbursement decreases, taking money out of the emergency care safety net.

Staff, Chapter leaders, and members engaged Assembly Member Bonta on this issue and participated in numerous stakeholder meetings in an attempt to find a fair solution for emergency physicians and patients. We tried to get our fair payment provisions amended into AB 533. Ultimately, in the final week of session, Assembly Member Bonta adopted the general framework of our proposal, but the interim payment was set too low – 125% of Medicare. Additionally, the design of the IDRP, as well as the basis for determining a fair payment, was left entirely in the hands of regulators. Despite the bill having the important goal of protecting patients from being involved in disputes between physicians and insurers about fair reimbursement, AB 533 chose health plans and insurers as the winners and physicians as the losers.

Due to the continued concerns raised by California ACEP, emergency medical services were exempted from the bill. AB 533 was eventually defeated on the final day of the 2015 legislative session. Negotiations continued over the winter and in 2016, a new bill was negotiated and introduced. That bill also exempted emergency medical services and was signed into law.

While many states have taken action to address surprise bills, the Federal government has not acted and has exclusive jurisdiction.
over ERISA plans. Last year, it became clear that Congress and the
President were interested in taking on this issue. During this past
winter, California ACEP participated in strategy calls with ACEP’s
government affairs staff to outline our experience and to provide
advice on how to approach federal legislation.

At the time we wrote this article, there were numerous federal
proposals coming to fruition. The three main pieces of surprise
billing legislation in Congress are: Stopping the Outrageous Practice
(STOP) of Surprise Medical Bills Act of 2019 by Senator Bill Cassidy,
the No Surprises Act by Congressmembers Frank Pallone and Greg
Walden, and the Protecting People From Surprise Medical Bills Act by
Congressman Raul Ruiz, MD. All three uphold similar principles but
take different approaches.

The STOP Surprise Medical Bills Act is a bipartisan bill and viewed by
many as the most likely to pass. This bill establishes loser-pays,
baseball-style arbitration for resolving disputes, but directs the arbiter
to only consider insurer-directed in-network rates for comparable
services in the same geographic area. ACEP has raised concerns that
this guideline will only further encourage insurers to drop contracts in
order to drive down the in-network rates being considered. Likewise,
ACEP has raised concerns that there is no methodology or data source
specified for the arbiter to use and ACEP has pushed for the use of
an objective, not-for-profit, independent database, like FAIR Health.
Other portions of the STOP Surprise Medical Bills Act are positive, like
recognizing deductibles as cost sharing for emergency care, requiring
insurers to print deductible amounts on each insurance card, and
requiring insurers to pay any amounts owed directly to the provider.

The No Surprises Act prohibits balance billing for all emergency
services and patients would only be held responsible for the amount
they would have paid in-network, it also requires that patients
receiving scheduled care be given written and oral notice at the time
of scheduling about the provider’s network status. The bill establishes a
minimum payment standard set at the median contracted in-network
rate for the service in the geographic area the service was delivered, but
it preserves a state’s ability to determine their own payment standards
for plans regulated by the state. ACEP has urged the authors to include
more requirements for increased transparency of insurance networks
and baseball-style arbitration to ensure fast and fair resolution of any
billing disputes.

Not surprisingly, the bill authored by an emergency physician most
closely adheres to ACEP’s principles. The Protecting People from
Surprise Medical Bills Act would ban the practice of billing patients
for unanticipated out-of-network care, implements a baseball-
style arbitration model in which a neutral arbiter chooses the more
reasonable payment price (between what is paid and what is billed),
and improves transparency by requiring health plans to clearly identify
in-network providers and patients’ deductibles. The legislation also
includes an exemption for fully-insured plans in states that have
balanced billing laws or regulations.

While ACEP does your federal lobbying and legislative efforts, California
ACEP has been following this all very closely and working with ACEP
and our physician leaders to try to ensure that federal legislation does
not undermine protections we have fought for in California.

Both patients and providers deserve protection from health plans and
insurers who do not contract fairly to provide adequate networks.
Patients do not choose where and when they will need emergency
services and should not face post-care financial burdens for seeking
emergency care. Likewise, emergency physicians are required to see
every patient and, to meet that mission, need to be compensated
fairly. Patients and providers should be protected from this cost-shift
by imposing a fair payment standard on health plans and insurers.
The payment standard for out-of-network services should be at a level
which encourages contracting and results in the fewest number of
appeals to the IDR.

We continue to be committed to a solution that removes patients
from out-of-network billing disputes and does not do so at the
expense of providers.

To read more about the Federal Surprise Billing efforts visit:
https://www.acep.org/federal-advocacy/federal-advocacy-
overview/acep4u-out-of-network/.

CALIFORNIA ACEP WANTS YOU TO

SHARE YOUR ACCOMPLISHMENTS

Did you get a new job? Get promoted?
Get published? Achieve a goal? Let
California ACEP know and we’ll include
it in a new section of Lifeline.

SHARE HERE: HTTP://BIT.LY/2CYJEJA
PERTUSSIS

The Identify, Isolate, Inform Tool Applied to a Re-emerging Respiratory Illness

Kristi L. Koenig, MD*†
Jennifer Farah, MD‡
Eric C. McDonald, MD, MPH§
Sayone Thihalolipavan, MD, MPH¶
Michael J. Burns, MD¶

* County of San Diego, Health & Human Services Agency, Emergency Medical Services, San Diego, California
† University of California Irvine, Department of Emergency Medicine, Orange, California
‡ University of California, San Diego, Department of Emergency Medicine, La Jolla, California
§ County of San Diego, Health & Human Services Agency, Public Health Services, San Diego, California
¶ University of California Irvine, Department of Emergency Medicine and Division of Infectious Diseases, Orange, California

Section Editor: Kevin Lunney, MD, MHS, PhD
Submission history: Submitted July 23, 2018; Revision received October 24, 2018; Accepted November 6, 2018 Electronically published December 2018
Full text available through open access at http://escholarship.org/uc/uciem_westjem
DOI: 10.5811/westjem.2018.11.40023

PERTUSSIS, commonly referred to as “whooping cough,” is a highly contagious acute respiratory infection that has exhibited cyclical outbreaks throughout the last century. Although vaccines have provided some immunity, many populations, including infants and pregnant women, remain at risk for serious illness. Through the use of the novel “Identify, Isolate, Inform” (3I) tool, emergency department (ED) providers can readily recognize key symptoms of the disease and risk factors for exposure, thus curbing its transmission through early initiation of antimicrobial therapy and post-exposure prophylaxis. The three classic stages of pertussis include an initial catarrhal stage, characterized by nonspecific upper respiratory infection symptoms, which may advance to the paroxysmal stage, revealing the distinctive “whooping cough.” This cough can persist for weeks to months leading into the convalescent stage. Household contacts of patients with suspected pertussis or other asymptomatic, high-risk populations (infants, pregnant women in their third trimester, and childcare workers) may benefit from post-exposure prophylactic therapy. The Pertussis 3I tool can also alert healthcare professionals to the proper respiratory droplet precautions during contact with a symptomatic patient, as well as isolation practices until antimicrobial treatment is in progress. ED personnel should then inform local public health departments of any suspected cases. All of these actions will ultimately aid public health in controlling the incidence of pertussis cases, thus ensuring the protection of the general public from this re-emerging respiratory illness. [West J Emerg Med. 2019;20(2)191–197.]

INTRODUCTION

Pertussis, commonly referred to as “whooping cough,” is an acute respiratory illness that is highly contagious. Bordetella pertussis, a Gram-negative bacterium, travels via respiratory droplets infecting human hosts. Worldwide epidemics have occurred throughout history, prompting study and control measures, including the development of vaccines. However, even in vaccinated populations, pertussis demonstrates periodic outbreaks. For example, in 2010 California experienced a large outbreak that reached the highest incidence rates of the disease since 1947. This outbreak involved over 9,000 individuals and led to 10 infant deaths. In 2017 there were over 15,000 cases in the United States, with California reporting the highest number at 1,742 cases.
Given this background, and following on previous work for Ebola virus disease, measles, Middle East Respiratory Syndrome, Zika, mumps, and hepatitis A, investigators developed a novel Pertussis Identify, Isolate, Inform (3I) tool for use by healthcare workers in the assessment and treatment of patients who may have pertussis (Figure).5-10 After an overview of the disease and critical information pertaining to transmission and treatment, we explain and present here the Pertussis 3I tool.

The presentation of pertussis varies widely, and can be affected by factors such as vaccination status and age. It is classically described as having three stages.11-14 After an initial incubation period of 7-10 days, the disease begins with the catarrhal stage, which has a duration of one to two weeks. This manifests as a mild cough with lachrimation and rhinorrhea. There may also be a low-grade fever. After the catarrhal stage, the patient may advance to the paroxysmal stage, which lasts two to four weeks. This is where the characteristic paroxysmal or “whooping cough” may occur, described as a grouping of multiple short coughs followed by a single, forceful inspiratory “whoop.” An audio example of this signature cough is available here: http://www.pkids.org/diseases/pertussis.html. This cough may be associated with emesis, cyanosis or even apnea.15 The third or convalescent stage is characterized by a persistent cough that can last from four weeks up to several months. This is why pertussis is known as the “100-day cough” in China.16

Older children, adolescents, and adults may report a nonproductive cough that is worse at night or feelings of a choking sensation. They likely will be asymptomatic between coughing episodes.11 Presenting symptoms may be nonspecific in both infants and older patients. Young infants may initially be afebrile with mild symptoms that rapidly progress to respiratory distress/apnea, hypoxia or seizures.12

Risk Factors
Unvaccinated individuals, or those who have not yet completed the vaccine series, are the most at risk. This includes infants  <6 months of age, who are also at the highest risk for severe outcomes.17 However, even persons who have received the vaccine series lose their immune status within six to eight years of their last injection or 15 years after infection.18 Thus, remaining up to date with vaccination is imperative, especially when traveling abroad to areas with increased disease incidence.19 Additionally, household contacts and those considered high risk, who have known exposure, should receive treatment in the form of post-exposure prophylaxis (PEP) (see “Treatment” section).

Diagnosis
Nasopharyngeal cultures, polymerase chain reaction (PCR) testing and serologic studies are available to confirm an infection with Bordetella pertussis, the causative organism.20 However, these tests offer varying levels of sensitivity and may not be obtainable in a timely fashion to confirm cases in the acute setting. Furthermore, other laboratory studies, such as a complete blood count (CBC), may be helpful in distinguishing causes for cough, but only in certain age groups (see “Differential Diagnosis” section). Imaging studies also provide limited information, as patients often do not demonstrate significant findings on chest radiograph. However, chest imaging may be helpful in assessing for superinfection.

Complications and Special Populations
Severe and sometimes fatal pertussis-related complications can occur in certain groups. These include infants <12 months of age, particularly those <four months, as well as pregnant women who are also at risk of transmitting the disease to their newborn children.17,19 Often, patients become secondarily infected with another bacterial or viral infection. Neonates are especially at risk for apnea and hemodynamic instability (i.e., bradycardia, hypotension). Although rare, seizures and encephalopathy can also occur.12,17,19

Transmission and Personal Protective Equipment
Pertussis has no known animal or environmental hosts.1 It travels from human to human via respiratory droplets from a cough or sneeze. Patients who have not yet started or completed the initial vaccine series are at greatest risk of becoming infected. If there is concern that a patient has pertussis, healthcare workers should place the patient in isolation and don personal protective gear for respiratory droplet precautions.20

Prevention
In addition to protective measures to avert disease transmission, the most important preventative measure is vaccination. In 2018, the Centers for Disease Control (CDC) and Prevention’s Advisory Committee on Immunization Practices published the following vaccine recommendations:21

- Infants and young children: five-dose series of diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccines, with one adolescent booster dose of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis (Tdap) vaccine
- Adults: booster dose of Tdap (regardless of vaccine status)
- Pregnant Women: one-dose Tdap to be administered sometime during 27-36 weeks gestation (third trimester), regardless of previous receipt of Tdap
- Persons >11 years with close contacts of infants (e.g., parents, siblings, grandparents, child care providers, and healthcare providers): administer a single dose of Tdap if they have not previously received Tdap
- Healthcare personnel: administer a single dose of Tdap if they have not previously received Tdap
Differential Diagnosis

Given the nonspecific nature of presenting symptoms, diagnosing pertussis can be challenging. In addition, the characteristic “whooping” cough is only appreciated in a minority of patients. Thus, other causes for similar complaints must also be considered, including upper respiratory infections or pneumonia. Clinicians should also contemplate asthma, bronchiolitis (respiratory syncytial virus) or adenovirus in the differential diagnosis for children. Of special note, in infants nearly all fatal cases of pertussis present with an extreme leukocytosis with lymphocytosis. Thus, obtaining a CBC may be helpful to distinguish between causes of cough in pediatric patients; however, its utility remains limited. Adults presenting with cough may have non-infectious causes for their symptoms such as chronic obstructive pulmonary disease, congestive heart failure, or gastroesophageal reflux disease. Foreign body aspiration is also possible in patients presenting with cough and is sometimes associated with cyanosis or apnea.
Treatment

Suctioning and other airway management is a mainstay of management. As with other conditions, in the presence of hypoxia or respiratory distress, supplemental oxygen should be applied. Intravenous fluids may also be needed for treatment of dehydration. In addition to supportive care, antimicrobial treatment is recommended. Macrolides are the preferred treatment, which include azithromycin, clarithromycin or erythromycin. For infants <one month of age, azithromycin is the preferred antibiotic. For patients who cannot tolerate these medications, and are >two months of age, trimethoprim/sulfamethoxazole is recommended.

PEP is limited to certain groups (Table). These include household contacts of a pertussis case and high-risk populations. With regard to household exposures, even if these contacts are asymptomatic and/or current with immunizations, it is recommended they receive antimicrobial treatment within 21 days of cough onset in the index patient. High-risk groups include infants, women in their third trimester of pregnancy, caregivers or household contacts of infants, and anyone who works in or attends a childcare setting. Antibiotic selection and duration of treatment for either PEP or a confirmed case of pertussis are identical. Depending on the patient’s age and therapy choice, treatment includes a 5-14 day course of a macrolide, with the treatment duration dependent on the macrolide chosen. In cases of PEP, treatment should be initiated within 21 days of exposure.

Disposition

Although dependent on provider judgment, patients with mild to moderate disease can be safely discharged home to undergo antibiotic treatment, with careful attention noted to household contacts or other possibly exposed individuals. Hospital admission is recommended for neonates because they are at risk for apnea. Additionally, admission is recommended for patients <six months of age or who have a history of prematurity. Other symptoms to consider when determining need for hospitalization include inability to tolerate fluids or persistent dependence on supplemental oxygen. Admitted patients should be maintained in respiratory droplet isolation.

### TABLE. CANDIDATES FOR PERTUSSIS POST-EXPOSURE PROPHYLAXIS.

<table>
<thead>
<tr>
<th>Household contacts</th>
<th>High-risk individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Even if asymptomatic and/or current with immunizations, should receive antimicrobial treatment within 21 days of cough onset in the index patient</td>
<td>• Infants</td>
</tr>
<tr>
<td></td>
<td>• Women in their third trimester of pregnancy</td>
</tr>
<tr>
<td></td>
<td>• Caregivers or household contacts of infants</td>
</tr>
<tr>
<td></td>
<td>• Anyone who works in or attends a childcare setting</td>
</tr>
</tbody>
</table>

Identify, Isolate, Inform

**Identify**

Identification of two groups of patients is important: those who are symptomatic, and those who are asymptomatic but have been exposed. Both groups may benefit from treatment. Symptomatic individuals may present in any one of the three classic stages of pertussis, as discussed above. Some may be in the initial catarrhal phase, reporting mild upper respiratory symptoms, and others may have progressed into the paroxysmal phase, exhibiting the classic “whooping cough.” Other symptoms commonly reported include post-tussive emesis, cyanosis and apnea. Patients who have had a persistent cough for weeks, and perhaps months, may be in the convalescent phase. All of the aforementioned presentations may represent a patient with pertussis, making careful reviews of exposure history and immunization status essential. Importantly, those with previous vaccinations may present atypically and not exhibit classic features of pertussis.

Another important group to consider are those who deny symptoms, but report having been exposed to a person with confirmed pertussis. Pregnant women and infants are especially at risk; thus, review of this type of exposure is critical when deciding whether to initiate treatment. Patients are considered most contagious three weeks after the onset of the paroxysmal phase, where coughing spells are most prevalent. Thus, asking exposed patients when they were with the source patient could aid in assessing their individual risks.

**Isolate**

If a symptomatic, and thus potentially contagious, patient has been identified, he or she should immediately be placed in droplet isolation. Healthcare personnel should also don personal protective gear for respiratory droplet precautions, irrespective of their own vaccine status. This includes donning a standard surgical mask. Patients are considered infectious from the beginning of the catarrhal stage until three weeks after the onset of the paroxysmal stage. Thus, isolation may be needed during this length of time. However, evidence suggests that those undergoing antibiotic treatment may no longer be contagious five days after initiating treatment.

This timeline is even more important when one considers returning to school or work. With the former, the CDC and the American Academy of Pediatrics recommend children with pertussis refrain from attending school until they have completed five days of antibiotic treatment. This policy is adopted by some public health authorities to adopt a more liberal policy of allowing children who have started, but perhaps have not yet completed, their antibiotic course to attend school. Consultation with one’s local health department
may assist with this decision. In summary, discretion must be taken when a patient is undergoing either inpatient or outpatient treatment, particularly when close contacts include infants or pregnant women.

Diagnosis should be confirmed with nasopharyngeal cultures, PCR testing and/or serologic studies. Test selection is based on the timeframe of symptoms. If the patient reports a cough of less than two weeks duration, both a culture and PCR should be performed. If the cough has been present for between two and four weeks, culture becomes less reliable, and thus PCR is recommended. Serology is the only reliable diagnostic tool after four weeks of symptoms. However, serology measures pertussis antibodies, and these levels may be affected by stage of the disease and vaccination status. Therefore, providers should consider these confounding factors when interpreting serologic studies.

Practitioners must pay close attention to use of the proper technique for obtaining a nasopharyngeal specimen, whether it is for culture or PCR testing. B. pertussis resides in the posterior nasopharynx. Therefore, the swab must be inserted past the anterior nare to ensure optimal collection. Cotton-tipped or rayon swabs should not be used, as they contain chemicals that can alter results; rather, a calcium alginate or polyester (e.g., dacron) swab affixed to a long metal shaft is indicated. A video depicting the proper technique for specimen collection is available on the CDC website at https://www.cdc.gov/pertussis/clinical/diagnostic-testing/specimen-collection.html.

**Inform**

If a pertussis case is suspected, healthcare workers should contact their local health department, as well as their hospital infection prevention department. Clinicians should also assess for household or other close contacts and provide them with appropriate education and follow up. Contacting public health agencies can occur through a number of channels, and may depend on local public health department policies. Providers should notify their local public health agency of any cases of suspected pertussis. This may include patients with paroxysms of cough, the classic inspiratory “whoop,” post-tussive emesis and/or apnea (for infants less than one year old). Laboratories who identify confirmatory tests for pertussis should also report to local public health authorities. Local public health agencies can then forward their findings to state agencies, which will then share this information with the CDC through the National Notifiable Diseases Surveillance System (NNDSS). This chain of reported information allows for further investigation. Given the limitations of confirmatory testing, it becomes even more essential for healthcare workers to report clinically suspected cases of pertussis, so that health officials can conduct continued surveillance.

**CONCLUSION**

CDC reports suggest the incidence of pertussis exhibits cyclical rises and falls. Therefore, there is an imminent need to routinely educate healthcare workers on its clinical features and epidemiologic properties so that they can promptly detect and appropriately manage pertussis cases. The novel Pertussis Identify, Isolate, Inform (3I) tool can aid emergency department staff in readily recognizing key symptoms of the disease and risk factors for exposure. The Pertussis 3I tool can also alert the healthcare workforce to the appropriate isolation protocols for use during contact with a symptomatic patient. With this added knowledge, healthcare workers can protect both themselves and others (especially infants and pregnant women) from contracting disease. Further, they can educate patients, in addition to exposed individuals, on the importance of early antimicrobial therapy as well as notify the appropriate hospital and public health agencies. All of these actions will ultimately aid public health in controlling the incidence of pertussis cases, thus ensuring the protection of the general public from this re-emerging respiratory illness.

**ACKNOWLEDGEMENTS**

A special thank you to Kathleen Harriman, PhD, MPH, RN, Chief of the Vaccine Preventable Disease Epidemiology Section, California Department of Public Health, Immunization Branch, for her contributions to the Pertussis 3I tool.

**REFERENCES**

YOUR LIFE IN EMERGENCY MEDICINE

CALIFORNIA ACEP’S ANNUAL CONFERENCE 2019

Education is targeted to Medical Students and Residents, but all are welcome to attend.

Friday, September 20, 2019
Hyatt Regency, Orange County, CA
In November 2018, Larry Bedard was reelected to his 5th term on the Marin Healthcare District Board.

Stephanie Benjamin self-published her first book, “Love, Sanity, or Medical School.” The gonzo-journalism style account of her third year of medical school unfolds in real-time, so the events that occur are as much a surprise to her as they are to the reader! It has been described as a cross between Helen Fielding’s humorous “Bridget Jones’s Diary” and Samuel Shem’s novel "House of God."

UCSD Chief Resident Frannie Rudolf, MD presented at the 2019 CORD Clinical Pathologic Case Competition. She was the Resident Runner-up in Division 5 of the Clinical Pathologic Case Competition competition.

Kristy Schwartz, MD, MPH, FACEP presented a complex case at CORDAA19 and won the CORD Clinical Pathologic Case Competition Division 5 as Faculty Discussant.

Tiffany Anaebere, MD; Evan Laveman, MD; and Ashley Rider, MD presented at CORD’s 2019 Academic Assembly.

Jeffrey Sakamoto, MD; Collin Michels, MD; Bryn Eisfelder, MD; and Nikita Joshi, MD wrote an article “Trauma in Pregnancy”, that was published in *Emergency Medicine Clinics of North America*.

Jeff Riddell, MD won the CORD Academy Members Education Research Award.

Kara Toles, MD presented her insights for the pilot year of UC Davis academic coaching program at the Association of American Medical Colleges meeting.

Holly Caretta-Weyer, MD; Phillip Harter, MD, FACEP; Ryan Pedigo, MD; and Dina Wallin, MD received the 2018 AEM Education and Training Journal Outstanding Reviewers Award.

Elissa Moore, DO presented a case of Fomepizole mono therapy for massive ethylene glycol ingestion at the American College of Medical Toxicology 2019 Scientific Meeting.

Yanika Wolfe, MD won first place at the Society of Clinical Ultrasound Fellowships’ lightning rounds.

Mitesh Patel, MD, FACEP; Doris Moradzadeh, MD, FACEP; and Brett Rosen, MD, FACEP received their Fellow designation from the College.

---

**MEMBER Accomplishments**

**Member Accomplishments**

In November 2018, Larry Bedard was reelected to his 5th term on the Marin Healthcare District Board.

Stephanie Benjamin self-published her first book, “Love, Sanity, or Medical School.” The gonzo-journalism style account of her third year of medical school unfolds in real-time, so the events that occur are as much a surprise to her as they are to the reader! It has been described as a cross between Helen Fielding’s humorous “Bridget Jones’s Diary” and Samuel Shem’s novel "House of God."

UCSD Chief Resident Frannie Rudolf, MD presented at the 2019 CORD Clinical Pathologic Case Competition. She was the Resident Runner-up in Division 5 of the Clinical Pathologic Case Competition competition.

Kristy Schwartz, MD, MPH, FACEP presented a complex case at CORDAA19 and won the CORD Clinical Pathologic Case Competition Division 5 as Faculty Discussant.

Tiffany Anaebere, MD; Evan Laveman, MD; and Ashley Rider, MD presented at CORD’s 2019 Academic Assembly.

Jeffrey Sakamoto, MD; Collin Michels, MD; Bryn Eisfelder, MD; and Nikita Joshi, MD wrote an article “Trauma in Pregnancy”, that was published in *Emergency Medicine Clinics of North America*.

Jeff Riddell, MD won the CORD Academy Members Education Research Award.

Kara Toles, MD presented her insights for the pilot year of UC Davis academic coaching program at the Association of American Medical Colleges meeting.

Holly Caretta-Weyer, MD; Phillip Harter, MD, FACEP; Ryan Pedigo, MD; and Dina Wallin, MD received the 2018 AEM Education and Training Journal Outstanding Reviewers Award.

Elissa Moore, DO presented a case of Fomepizole mono therapy for massive ethylene glycol ingestion at the American College of Medical Toxicology 2019 Scientific Meeting.

Yanika Wolfe, MD won first place at the Society of Clinical Ultrasound Fellowships’ lightning rounds.

Mitesh Patel, MD, FACEP; Doris Moradzadeh, MD, FACEP; and Brett Rosen, MD, FACEP received their Fellow designation from the College.

---

**Did you get a new job? Get promoted? Get published? Achieve a goal?**

Let California ACEP know and we will include it in this new section of Lifeline. Tweet your accomplishment and tag @californiaacep or submit your accomplishments at: [HTTPS://CALIFORNIAACEP.SITE-YM.COM/SURVEYS/?ID=ACCOMPLISHMENTS](https://californiaacep.site-ym.com/surveys/?id=accomplishments).
Donors

The California Emergency Medicine Advocacy Fund (CEMAF) has transformed California ACEP’s advocacy efforts from primarily legislative to robust efforts in the legislative, regulatory, legal, and through the Emergency Medical Political Action Committee, political arenas. Few, if any, organization of our size can boast of an advocacy program like California ACEP’s; a program that has helped block Medi-Cal provider rate cuts, lock in $500 million for the Maddy EMS Fund over the next 10 years, and fight for ED overcrowding solutions! The efforts could not be sustained without the generous support from the groups listed below, some of whom have donated as much as $0.25 per chart to ensure that California ACEP can fight on your behalf. Thank you to our 2018-19 contributors (in alphabetical order):

• Alvarado Emergency Medical Associates
• Antelope Valley Emergency Medical Associates
• Beach Emergency Medical Associates
• Chino Emergency Medical Associates
• Coastline Emergency Physicians Medical Group
• Culver Emergency Medical Group
• Hollywood Presbyterian Emergency Medical Associates
• Las Cruces Emergency Medical Associates
• Los Alamos Emergency Medical Associates
• Mills Peninsula Emergency Medical Group
• Orange County Emergency Medical Associates
• Pacific Coast Emergency Medical Associates
• Riverside Emergency Physicians
• San Dimas Emergency Medical Associates
• Sherman Oaks Emergency Medical Associates
• South Coast Emergency Medical Group, Inc.
• Tarzana Emergency Medical Associates
• TeamHealth
• Temecula Valley Emergency Physicians, Inc.
• US Acute Care Solutions
• Valley Emergency Medical Associates
• Valley Presbyterian Emergency Medical Associates
• Vikant Gulati, MD, FACEP
• Vituity
• West Hills Emergency Medical Associates

SAVE THE DATE

AdvancED 2019
September 20, 2019 | Garden Grove, California
Registration launches online in June.

SUBMIT A LIFELINE ARTICLE

Looking for a way to share your emergency medicine experience? Want to share a story from your last shift? Or maybe career or life advice? We’re looking for member and guest articles, including letters-to-the-editor. Please note that all articles and letters are reviewed and may be edited for grammar and content.

If you would like more information or would like to submit a guest article, email info@californiaacep.org.
For more information on upcoming meetings, please e-mail us at info@californiaacep.org; unless otherwise noted, all meetings are held via conference call.

**JUNE 2019**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>6th at 10 AM</td>
<td>Board of Directors Meeting</td>
<td>Sacramento, CA</td>
</tr>
</tbody>
</table>

**JULY 2019**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd at 9 AM</td>
<td>Reimbursement Committee Conference Call</td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>Independence Day Office Closed</td>
<td></td>
</tr>
<tr>
<td>18th at 10 AM</td>
<td>Government Affairs Committee (GAC) Conference Call</td>
<td></td>
</tr>
</tbody>
</table>

**AUGUST 2019**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>13th–14th</td>
<td>Board of Directors Retreat</td>
<td>Sacramento, CA</td>
</tr>
</tbody>
</table>
FULLERTON, CALIFORNIA: Join our ED team in beautiful north OC at St Jude Med Center. Our 36 bed ED serves >70K pts/yr with 54-60 hrs MD, 44 hrs PA and 100% scribe coverage per day, 9-10 hr shifts. We have held this stable contract for >36 years, have excellent back-up, 24hr in house Critical Care, OB, neonatologist and hospitalists. We are a STEMI receiving center, "Advanced Comprehensive Stroke Center" and provide excellent compensation with night differential. Partnership track negotiable. EM BC/BE mandatory. Send CV to kohparker@gmail.com

SOUTHERN CALIFORNIA OPPORTUNITIES:
• Tustin, CA - Orange County - 73-bed community hospital, 8-bed ER, paramedic receiving, low volume. 10 x 24hr = $240,000/yr + incentive
• East Los Angeles - 120-bed community hospital urgent care (non paramedic receiving) volume 700/mo. Guarantee $100/hr.
• Norwalk, CA - 60-bed hospital. 500-600 patient/mo. Paramedic receiving. $110/hr.
• San Fernando Valley - 18000 visits $350000 per year with incentives Med surg with psyche beds. Overlap or NP or PA for busy times.
• HOSPITALIST OPENINGS ALSO AVAILABLE
FAX CV to 213 482 0577 or call 213 482 0588 or email neubauerjanice@gmail.com

SOUTHERN CALIFORNIA – ORANGE COUNTY: Positions available for full and part time BC/BE EM and Peds EM physicians. Partnership track is available for full time physicians. We are a stable, democratic group established in 1976 serving two best in class hospitals. St. Joseph Hospital is a STEMI center and Stroke Center with 80,000 visits per year. CHOC Children’s Hospital is a Level II trauma center, tertiary referral center and teaching hospital (several residency and fellowship rotations) with 80,000 visits per year. Excellent call panel coverage, excellent compensation, malpractice and tail coverage, and scribe coverage. Sign on bonus for full time hires.

Email CV and references to EMSOC@emsoc.net, fax to 714-543-8914

SOUTH ORANGE COUNTY: Mission Hospital and Children’s Hospital at Mission, a CMS 5-Star rated full service hospital. We are an established, independent, democratic group staffing this ED for 22 years. Excellent compensation; malpractice paid; scribes; midlevel providers.
We seek an EM residency trained physician for a partnership track. Excellent coverage and midlevel provider support allow for high job satisfaction. UC Irvine EM residents on rotation allow for teaching opportunities. Two full-time, dedicated nocturnists work 6 nights a week. All other physicians average 6 overnight shifts per year!
The department serves both a pediatric and adult base station hospital serving all of south OC. High acuity, 70,000 patients a year, comprehensive referral center, outstanding adult and pediatric sub specialty coverage, adult and pediatric trauma center, STEMI Center, and Stroke Center. Send CV to: MaryAnn.Hubbard@StJoe.org

VENTURA CALIFORNIA: We have moved into our brand new Hospital and Emergency Department as of December 2018! Central coast of California and 70 miles from LAX. Positions available in two facilities for BC/BE emergency physician. STEMI Center, Stroke Center with on-call coverage of all specialties. Teaching facility with residents in Family Practice, Surgery, Orthopedics and Internal Medicine. Admitting hospital teams for Medicine and Pediatrics. Twenty-four hour OB coverage in house and a well established NICU. Physician’s shifts are 9 hrs and two 12 hour shifts of PA/NP coverage. All shifts and providers have scribe services 24/7. Affiliated hospital is a smaller rural facility 20 minutes from Ventura in Ojai. Malpractice and tail coverage is provided. New hires will work days, nights, weekends and weekdays. Send resume to Alex Kowblansky MD FACEP at kowblansky@cox.net

To advertise with Lifeline and to take advantage of our circulation of over 3,000 readers, including Emergency Physicians, Groups, and Administrators throughout California who are eager to learn about what your business has to offer them, please contact us at info@californiaacep.org or give us a call at (916) 325-5455.
Looking for an ITLS course?
EMREF offers the following California providers list:

American Health Education, Inc
Perry Hookey, EMT-P
7300B Amador Plaza Road, Dublin, CA 94568
Phone: (800) 483-3615
Email: info@americanhealtheducation.com
Web: www.americanhealtheducation.com

American Medical Response (AMR)
Ken Bradford, Operations
841 Latour Court, Ste D, Napa, CA 94558-6259
Phone: (707) 953-5795
Email: ken.bradford2@gmail.com

Compliance Training
Jason Manning, EMS Course Coordinator
3188 Verde Robles Drive, Camino, CA 95709
Phone: (916) 429-5895
Fax: (916) 256-4301
Email: Kurgan911@comcast.net

CSUS Prehospital Education Program
Thomas Oakes, Program Director
3000 State University Drive East, Napa Hall, Sacramento, CA 95819-6103
Office: (916) 278-4846
Mobile: (916) 316-7388
Email: thomasoak@sbcglobal.net
Web: www.ccs.csus.edu

EMS Academy
Nancy Black, RN, Course Coordinator
1170 Foster City Blvd #107, Foster City, CA 94404
Phone: (866) 577-9197
Fax: (650) 701-1968
Email: nancy@caems-academy.com
Web: www.caems-academy.com

ETS – Emergency Training Services
Mike Thomas, Course Coordinator
3050 Paul Sweet Road, Santa Cruz, CA 95065
Phone: (831) 476-8813
Toll-Free: (800) 700-8444
Fax: (831) 477-4914
Email: mthomas@emergencytraining.com
Web: www.emergencytraining.com

Loma Linda University Medical Center
Lyne Jones, Administrative Assistant
Department of Emergency Medicine
11234 Anderson St., A108, Loma Linda, CA 92354
Phone: (909) 558-4344 x 0
Fax: (909) 558-0102
Email: LJones@llhs.llumc.edu
Web: www.llu.edu

Medic Ambulance
James Pierson, EMT-P
506 Couch Street, Vallejo, CA 94590-2408
Phone: (707) 644-1761
Fax: (707) 644-1784
Email: jpierson@medicambulance.net
Web: www.medicambulance.net

Napa Valley College
Gregory Rose, EMS Co-Director
2277 Napa Highway, Napa CA 94558
Phone: (707) 256-4596
Email: grosso@napavalley.edu
Web: www.winountyycpr.com

NCTI – National College of Technical Instruction
Lena Rohrabaugh, Course Manager
333 Sunrise Ave Suite 500, Roseville, CA 95661
Phone: (916) 960-6284 x 105
Fax: (916) 960-6295
Email: jloasa@caltel.com
Web: www.ncti-online.com

PHI Air Medical, California
Eric Lewis, Course Coordinator
801 D Airport Way, Modesto, CA 95354
Phone: (209) 550-0884
Fax: (209) 550-0885
Email: elewis@philhelico.com
Web: http://www.phiairmedical.com

Riggs Ambulance Service
Greg Petersen, EMT-P, Clinical Care Coordinator
100 Riggs Av, Merced, CA 95340
Phone: (209) 725-7010
Fax: (209) 725-7044
Email: Gregg@riggsambulance.com
Web: www.riggsambulance.com

Rocklin Fire Department
Chris Wade, Firefighter/Paramedic
3401 Crest Drive, Rocklin, CA 95765
Phone: (916) 625-5311
Fax: (209) 725-7044
Email: Chris.Wade@rocklin.ca.us
Web: www.rocklin.ca.us

Rural Metro Ambulance
Brian Green, EMT-P
1345 Vander Way, San Jose, CA 95112
Phone: (408) 645-7345
Fax: (408) 275-6744
Email: brian.green@metro.com
Web: www.metro.com

Defib This (ERT)
Brian Green, EMT-P
1543 Pacific Avenue, Suite 104, Capitola CA 95010
Phone: (831) 426-9111
Web: www.defibthis.com

Verihealth/Falck Northern California
Ken Bradford, Training Coordinator
2190 South McDowell Blvd, Petaluma, CA 94954
Phone: (707) 766-2400
Email: kbradford@falck.com
Web: www.verihealth.com

If you are an EMS Director and would like to provide chest, head shock-injury training to your team, contact California ACEP to get started!
ITLS is the only pre-hospital trauma program endorsed by ACEP, since 1986, and is accepted internationally as the standard training course for pre-hospital trauma care.

Search for upcoming courses: http://cms.itrauma.org/CourseSearch.aspx

EMREF is a proud sponsor of California ITLS courses.

Please call 916.325.5455 or E-mail Lucia Romo: lromo@californiaacep.org for more information.
ADVANCED

YOUR LIFE IN EMERGENCY MEDICINE

CALIFORNIA ACEP’S ANNUAL CONFERENCE 2019

Education is targeted to Medical Students and Residents, but all are welcome to attend.

Friday, September 20, 2019 | Hyatt Regency, Orange County, CA