

Patient Symptoms & Outcomes

Nurse Triage Saves Lives

Only one in 10 parents who call a nurse triage line on behalf of their infants is told to go to the ER.

Surprisingly, one in every 3 adults who calls a nurse triage line is told to go to the ER.

By: Charu G. Raheja, PhD

¹Charu G. Raheja, PhD is the Chair and CEO of the TriageLogic Group. TriageLogic is a URAC accredited, physician-lead provider of high quality telehealth services, nurse triage, triage education, and software for telephone medicine. Their comprehensive triage solution includes integrated mobile access and two-way video capability. The TriageLogic group serves over 7,000 physicians and covers over 18 million lives nationwide. For more information visit www.triagelogic.com. and www.continuwell.com



Contents

Overall Patient Disposition from a Nurse Triage Line.....	03
Graph 1: Disposition given by Triage Nurses.....	03
Are Adults Less Likely to be Sent to the ER?.....	04
Graph 2: Disposition Given by Triage Nurses to 9,229 Adult Callers.....	04
Graph 3: Percent of Adults (ages 18 and above) Sent to the ER/ Urgent Care by Age Grou.....	05
Top 5 Reasons Adults are Sent to the ER by a Triage Nurse.....	06
Chest Pain.....	06
Abdominal Pain- Female.....	06
Back Pain Adult.....	06
Breathing Difficulty.....	07
Post-Op.....	07
How Often Are Infants Sent to the ER by a Triage Nurse?.....	08
Graph 4: Disposition Given by Triage Nurses to 6,464 Infant Callers (17 weeks to 1 year).....	08
Graph 5: Disposition Given by Triage Nurses to 2,955 Newborn Callers.....	09
Top 5 Reasons Infants are Sent to the ER by a Triage Nurse.....	10
Cough.....	10
Fever.....	10
Vomiting with Diarrhea.....	11
Wheezing without diagnosis of Asthma.....	11
Head Injury.....	11
Conclusion.....	12

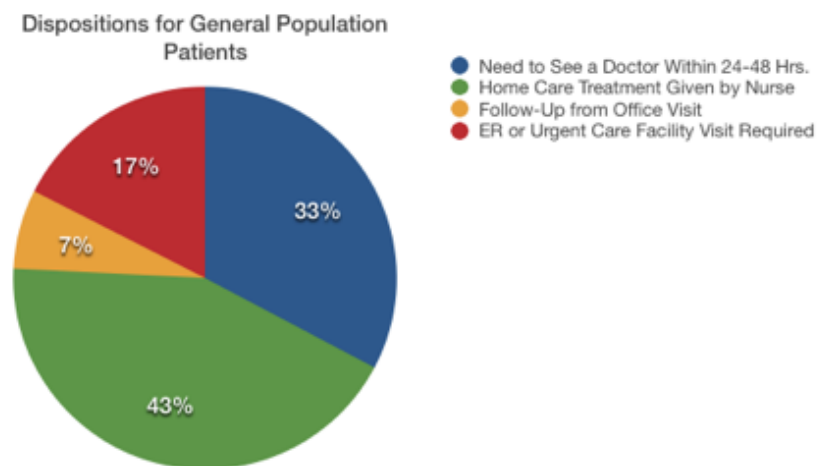
Overall Patient Disposition from a Nurse Triage Line

We studied treatment advice data from our nurse triage call center for the months of April, May, and June 2016. In those 3 months, our nurses triaged about 40,000 callers. Nurses ensured that all callers received standardized and high-quality care by using guided protocols written by Doctors Schmitt and Thompson. Nurses also sent triage notes to the patients' doctors, enabling the doctors to provide continuity of care for their patients by reviewing the notes and following up with patients if necessary. Graph 1 shows the nature of the treatment given by the nurses for all the callers to our center. We found the following key results for the overall data:



- We observed a higher percentage of female callers: 55% of callers were female vs. 45% of male callers.
- The top reasons why patients call are: medication question, fever, vomiting, sore throat and cough, rash or redness, immunization reactions (children), earache, and constipation.

Graph 1: Disposition given by Triage Nurses to 41,883 patients that called for the months of April, May and June 2016



Data from our Call Center for April, May, and June 2016

Next, we compare the triage advice given to adult callers and the advice given to patients ages 1 and under. About 9,200 were adult callers, and 9,400 were infants under the age of 1.

Are Adults Less Likely to be Sent to the ER?

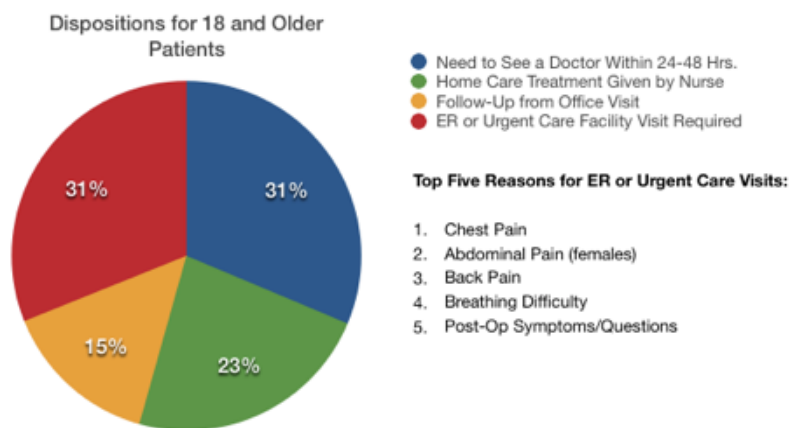


Often times, as adults, we think that we are better than children at determining if our symptoms are serious enough to require further care. As a result, many of us deny very serious symptoms. We think the severe headache is just a migraine. Or that the chest pain is not caused by a heart attack – that only happens to other people. However, we tend to be more cautious when it comes to our children. We often ask for advice when our children have a cut, a fever, or when they are crying inconsolably.

Surprisingly, we found adults had a significantly higher rate of ER referral and a much lower incidence of home care advice. Graph 2 breaks down the data for the adult callers. Compared to the entire population, here is what we discovered about patients 18 years and above:

- Less than $\frac{1}{4}$ of adults are given home care, in comparison to about $\frac{1}{2}$ for the overall population.
- Adults have a high ER referral rate: 1 in every 3 adults is sent to the ER, compared to 1 in 6 for the overall population.
- In both the adult and child groups, about 1 in 3 of the patients needed to follow up with a doctor's office in the next 24 to 48 hours.
- We also observed that by following the protocols, nurses most often sent adults to the ER for pain symptoms, particularly chest, abdominal, and back pain.
- Breathing difficulty and post operation complications were also one of the top 5 reasons why adult patients were sent to the ER.

Graph 2: Disposition Given by Triage Nurses to 9,229 Adult Callers (ages 18 and above) for April, May and June 2016, Including Top 5 Reasons for ER Disposition



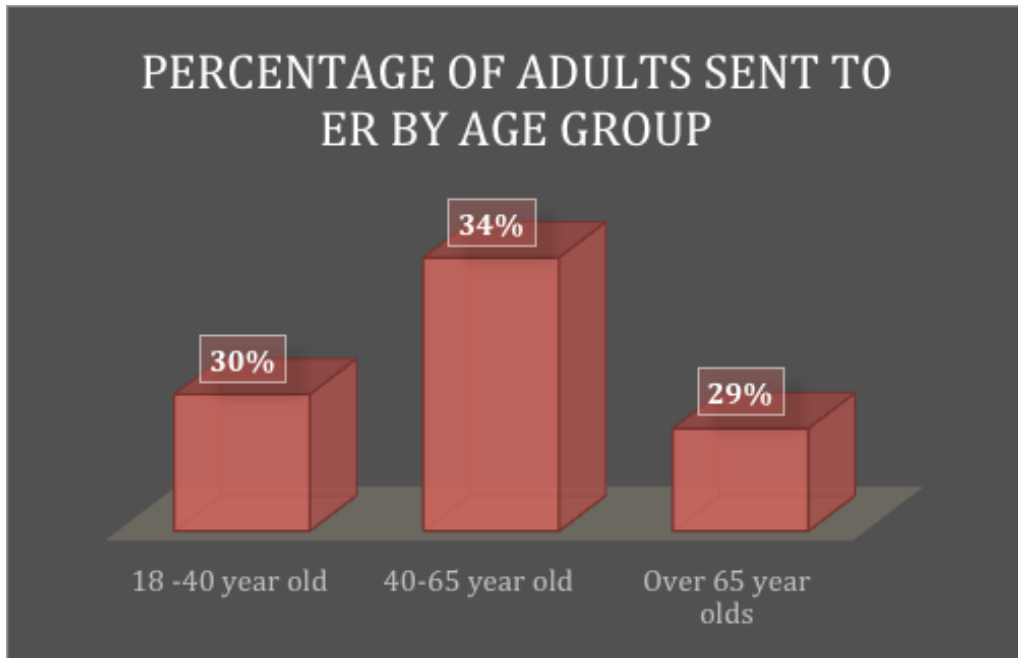
Data from our Call Center for April, May, and June 2016

As the results indicate, it is more difficult to be objective about our own symptoms than the symptoms of our loved ones. We don't always want to interrupt our day to find out that we have a minor symptom, but we do tend to worry when it comes to our family members, especially our children. As one of our Nurse Managers, Marci Lawing, observed:

“Adults will try everything without any assistance and usually only call their doctor or nurse triage line as a last resort. Parents, on the other hand, tend to be a lot more proactive about calling right away if their children experience unusual symptoms.”

This surprising result on the higher proportion of adult callers being told to go to the ER also brings in the question of whether the age of the caller makes a difference in ER referral rates. Are older adults more likely to be told to go to the ER than younger adults?

Graph 3: Percent of Adults (ages 18 and above) Sent to the ER/ Urgent Care by Age Group



We divided the adult data into 3 groups: 18 to 40 year old adults, 41 to 65, and over 65 years of age. Again, the results are surprising. Most people would expect the older adults to be the most likely to be sent to the ER. The oldest adult group was in fact the least likely to be told to go to the ER, at only 29 percent.

Top 5 Reasons Adults are Sent to the ER by a Triage Nurse

There are many elements that a triage nurse must take into consideration when choosing whether the emergency room is the most appropriate place for that patient. Each patient should be viewed as an individual and all risk factors, such as age, chronic illnesses, recent surgeries, medications, and lifestyle should be considered. Influences like age, culture, and economic factors may keep patients from calling a triage nurse until symptoms have progressed to the severe stage. In Graph 2, we listed the top 5 reasons an adult was sent to the ER by a triage nurse. Below, we go into detail about why those symptoms are serious and their early warning signs.

Chest Pain: Chest pain is a symptom that can range from benign, or very mild, to a life threatening cause. When a triage nurse hears the patient say they have chest pain, she will first rule out the “ABC’s”- making sure the patient is not having problems with their “Airway, Breathing or Circulation.” Using the protocols, a triage nurse will direct a patient to the ER if any of the following symptoms are present:

- Pain radiating to arm, shoulder or jaw
- Pain lasting more than 5 minutes and feels like crushing, pressure, or heavy
- Chest pain not relieved by nitroglycerin (call 911)
- Major surgery in the past month

Abdominal Pain- Female: There can be many causes of abdominal pain in females. The triage nurse must be extremely cautious and thorough when obtaining the patient’s assessment. Abdominal pain is a very common symptom and can be related to something as simple as overeating to something life threatening such as a ruptured abdominal aortic aneurysm. The location of the pain may give the nurse an indication of what could be causing the symptom(s.) For example, pain in the right upper quadrant may be associated with the liver or gallbladder, while pain in the right lower quadrant may be coming from the appendix, ovary or kidney. The following symptoms may require a trip to the ER:

- Severe pain at an 8, 9, 10 on scale of 1-10 and over the age of 60
- Severe, excruciating pain and present more than one hour
- Abdominal pain with vomiting that contains red blood or material appearing like coffee grounds
- Black or tarry bowel movements

Back Pain Adult: Over 80 percent of people experience lower back pain at some point in their lives. Luckily, most back pain is not serious and will subside within a few months. However, it could be as serious as an aortic aneurysm, compression fracture, kidney stones, or nerve root impingement. Because it is so common and so many people experience back pain, the nurse should take extra time to determine the cause and severity of the pain. Below are some symptoms that would lead to the ER:

- Severe, excruciating pain, sudden onset and age over the age of 60
- Back pain with urinary or bowel incontinence, new onset
- Severe pain that is not relieved two hours after pain medicine is given

Breathing Difficulty: While it is always alarming to hear a patient that is short of breath or wheezing, the triage nurse must remember to remain calm; sometimes this can be the patient's normal breathing pattern. The triage nurse must determine the severity of the patient's breathing and ask, what is their baseline and how is tonight different. If any of the following incidences are relevant for the patient, the nurse will direct them to the ER:

- Moderate shortness of breath, new onset and/or worse than normal
- Accompanied with symptoms such as chest pain, extreme and unexplained fatigue
- Co-morbidities, such as COPD, CHF and breathing is worse than normal
- History of blood clots in legs or lungs, or symptoms that would put the patient at risk for blood clots such as recent illness requiring prolonged bedrest, recent major surgery, recent long distance travel by car or plane where patient sat for long period of time
- Bleeding or clotting issues
- Associated with irregular heart rate/heart beat

Post-Op: Patients calling with post-op concerns can vary from anesthetic reactions, such as nausea, vomiting or drowsiness, to blood clots or bleeding, constipation, or more serious issues such as infections and dehiscence (opening of the incision). Symptoms that would alert the nurse that the patient needed to be seen in an emergency room might include:

- Bleeding from incision that won't stop after attempting home care advice
- Fever and incision looks infected and office does not open in 4 hours
- Severe pain in the incision, an 8, 9, or 10 on a scale of 1-10
- Widespread bright red sunburn-like rash



How Often Are Infants Sent to the ER by a Triage Nurse?



Pediatricians understand that a nurse triage line is imperative to help parents navigate early childhood. Still, it is sometimes difficult for parents to understand when calling a triage nurse is necessary for the safety of their children. Using the study of treatment advice from our triage nurses, we present data on the disposition advice given to parents when calling a triage nurse line. We also discuss the main symptoms that are associated with a need to take the infant to the ER. These

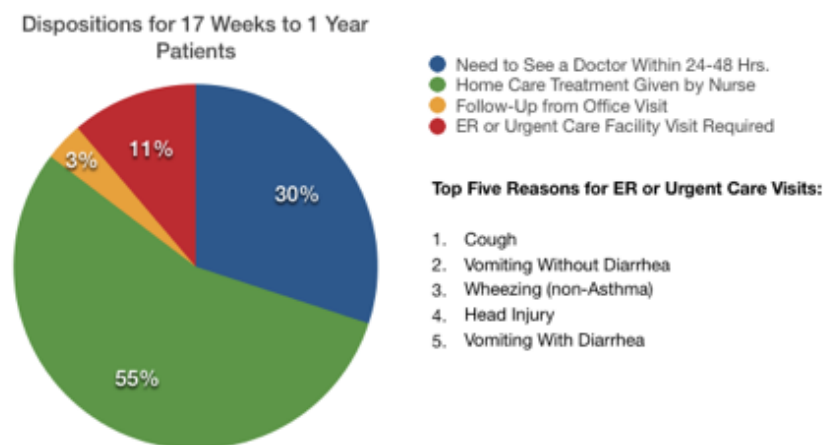
symptoms can be used by pediatricians and family practitioners to educate parents.

Below, we compared the disposition of adult callers to that of infants ages 1 and under. We initially predicted that infants would have the highest incident of ER or Urgent Care dispositions, with newborns having the highest rate of ER referral. Graphs 4 and 5 present the data for infants. Because of the different nature of care advice for newborns, we separate newborns between 0 to 16 weeks and infants between 17 weeks and 1 year.

The results of this comparison are surprising again. Contrary to what we predicted, we found that infants are sent to the ER at a much lower rate than adults. The results are as follows:

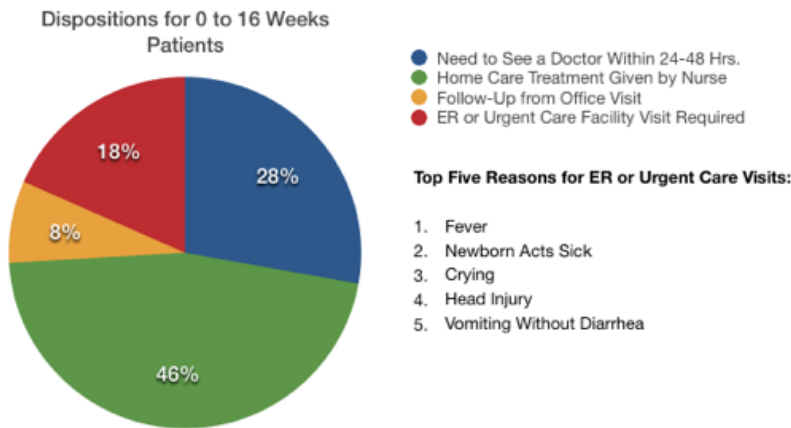
- More than half of the infants were given home care advice. This is more than double the percentage of adults given home care advice.
- Infants have a relatively low ER referral rate: only 1 in 10 infants are sent to the ER.
- Newborns have a higher incidence of being sent to the ER than infants, but this rate is still much less than that of adults. Roughly 2 in every 11 infants are sent to the ER, compared to almost 1 in 3 adults.

Graph 4: Disposition Given by Triage Nurses to 6,464 Infant Callers (17 weeks to 1 year) for April, May and June 2016, Including Top 5 Reasons for ER Disposition



Data from our Call Center for April, May, and June 2016

Graph 5: Disposition Given by Triage Nurses to 2,955 Newborn Callers for April, May and June 2016, Including Top 5 Reasons for ER Disposition



Data from our Call Center for April, May, and June 2016

As one would expect, the reasons that infants are sent to the ER are very different from adults. The top five symptoms that infants, 17 weeks to one year, were told to go to the ER or urgent care were cough, vomiting (with or without diarrhea), wheezing (non-asthma), and head injury. The symptoms that lead to newborns being directed to the ER or urgent care were slightly different. They included fever, acting sick, crying, head injury, and vomiting without diarrhea. These symptoms could be due to something as simple as a common cold or something life threatening that needs immediate professional attention. Our triage nurses do a thorough assessment in conjunction with standardized protocols to direct the parent to the best next steps to take. We will be elaborating on the different conditions that could be present with these symptoms below.



Top 5 Reasons Infants are Sent to the ER by a Triage Nurse

Our triage nurses use the Schmitt-Thomson protocols with each patient. In this three-month study, we discovered the top five protocols used when determining that an infant or newborn needed to go to the ER or Urgent Care. The top 5 protocols used by nurses when they determined that the infants needed to go to the ER or Urgent Care were cough, fever, vomiting (with or without diarrhea), wheezing (non-asthma), and head injury.

It is important for patients and parents to know the symptoms to look out for so that they can call a nurse triage line, like TriageLogic's Nurse Triage On Call to get the appropriate level of medical care. Below are the symptoms that a trained triage nurse will look for when deciding if the patient need urgent medical care.

Cough: When parents call a nurse triage line stating their child has a cough, it can be just a dry intermittent cough that is slightly annoying, or a more serious condition like croup, asthma, or an airway obstruction. Using standardized protocols, triage nurses must rule out the most serious causes first. These can include stridor, wheezing, severe retractions or bluish skin. Many times a cough is part of a viral illness such as a common cold. Parents can become concerned because coughs can linger after all the other symptoms of a cold have resolved. The parent will be told to take their infant to the ER if the following are present:

- Pronounced or severe rib retractions with each breath when not coughing
- Stridor, or a harsh or grating sound, is present
- Rapid breathing: breaths/minute
 - more than 60 if less than 2 months old
 - more than 50 if 2-12 months old
 - more than 40 if 1-5 years old
- Lips or face are bluish or turn bluish with coughing

Fever: Parents often call a triage nurse asking when their child can return to school or day care if they have a fever. The usual response is that the child can return once the fever is gone and the child feels well enough to participate in normal activities.

Fever is beneficial to many illnesses. They indicate that the immune system has kicked in and is fighting off an infection. Many times the fever is the first symptom and within 24 hours other symptoms such as vomiting, diarrhea, coughs or rashes will appear. A high fever could lead to serious complications, such as severe dehydration, hallucinations, and fever-induced seizure (febrile seizure). If the infant has any of the following they will be directed to go to the ER:

- Weak immune system, such as from chemotherapy, organ transplant, splenectomy
- Under 12 weeks old and any fever greater than 100.4° taken rectally, except if the infant had vaccinations that day and is otherwise acting normally
- Temperature greater than 105° by any route



Vomiting with Diarrhea: Vomiting and diarrhea is usually caused by a stomach virus, such as Rotavirus, but can also be from food poisoning or other illnesses. This can be dangerous for an infant because it will lead to dehydration. Severe dehydration can lead to seizures, low blood volume shock, kidney failure, coma, or death. An infant will be told to go to the ER if any of the following symptoms are present:

- Vomit contains blood or bile
- Child is hard to wake up
- Child is acting confused or disoriented
- If the vomiting/diarrhea is accompanied by severe abdominal pain that is constant
- Dehydration is suspected: no wet diapers, no urine output, dry mouth and tongue, no tears when child cries

Wheezing without diagnosis of Asthma: The main cause of wheezing before age 2 is bronchiolitis, which is a viral infection of the bronchioles (or small airways). According to the Mayo Clinic, wheezing could also be due to a structural abnormality in the airways or an issue with the vocal cords. After age 2, when wheezing is present it may indicate the first attack of asthma. The triage nurse will direct an infant to the ER if:

- Breathing difficulty still present after cleaning out the infant's nose
- Patient's age is less than 6 months
- Rapid breathing: breaths/minute
 - more than 60 if less than 2 months old
 - more than 50 if 2-12 months old
 - more than 40 if 1-5 years old
- Severe wheezing, can be heard across the room
- Child is high risk (has weak immune system, HIV, splenectomy, cancer etc...)

Head Injury: Most head injuries result in bumps and or bruising to the forehead but are not dangerous. There is a large blood supply to the scalp which makes even a small bump appear much bigger and bruise much quicker. Only 1-2 percent of children with a head injury will get a skull fracture. Regardless of how minor the fall or injury may seem, the nurse must complete a thorough assessment and rule out the emergent symptoms before settling on a less severe disposition. If the triage nurse finds any of the following they will direct the patient to the ER:

- Age under 3 months old
- Age 3-6 months of age, unless minor injury and infant now acting normally
- Altered mental status- confused, not alert, not focused, slow to respond
- Large dent in the skull
- Injury was from a fall where child fell a long way down or from an object traveling at high speed.

Conclusion

This study presents the dispositions and the top protocols used when a triage nurse determined that someone needed to go to the ER. While not everyone calling with the above symptoms needs to go to the ER, patients need to have access to a qualified professional 24/7 that can determine the sign of a serious illness or give home care and prevent a symptom from becoming serious. Nurse triage is a perfect bridge to provide 24/7 access for employees and their families to ask questions even when a symptom arrives after-hours or during a holiday. In addition, callers tend to be more comfortable calling a nurse because nurses are trained to provide comfort and evaluate if a symptom even requires a doctor visit. Using the telephone triage service can either save a family from needlessly going to the ER or urgent care and provide peace of mind for the patient, or ensure that the patient seeks immediate care in order to prevent further complications.



TriageLogic 
WHEN PATIENTS CALL, WE'RE YOUR ANSWER