

# Patient Safety Service

**G**lobally, there are 421 million hospitalizations and approximately 42.7 million adverse events each year.<sup>1</sup> Not all adverse events are detected or reported. We need to do better.

## The opportunity

CGI's Patient Safety Service (PSS) can scan thousands of patient charts in an instant, analyzing a massive amount of patient data. Using natural language processing, PSS detects potential adverse events which, once confirmed, collected, analyzed and acted upon, can change healthcare systems and save lives.

## The problem and the solution

Healthcare providers are not always able to identify when adverse events occur. Individuals receiving care often are very sick, and what looks like an adverse event could be a natural consequence of a disease. Alternately, what looks like a natural disease consequence could be the result of a procedure performed incorrectly or at the wrong time.

The Institute for Healthcare Improvement's Global Trigger Tool (GTT) is the basis for the PSS analytics engine. The GTT provides an especially valuable supplement to the traditional adverse event detection methods (e.g., voluntary reporting, chart audits, failure modes and effects analysis, and root cause analysis). Its key advantages include the ability to measure the rate of harm over time and to identify adverse events not detected using traditional methods.

## The detective powers of natural language processing

Using the rigor of the GTT, the PSS analytics engine automates the detection of triggers within an organization's clinical data ecosystem. Any and all data can be searched using natural language processing (NLP) as well as standard queries of coded and structured data.

A clinical service chooses the most common, most useful GTT triggers and then implements them using our rules engine. Potential adverse event results are retrieved and displayed in an easy to navigate user interface. Adverse events are confirmed, classified and recorded, forming the basis for measuring the rate of harm over time. In addition, patterns and trends in care delivery challenges are discovered, visualized and channeled into practice guidelines, learning and development activities, process changes or policy development.



Data has been changing how we manage healthcare over the past 20 years.

We have seen the advent of admission discharge and transfer systems, registries, computer physician order entry, health information exchanges, repositories and clinical information systems.

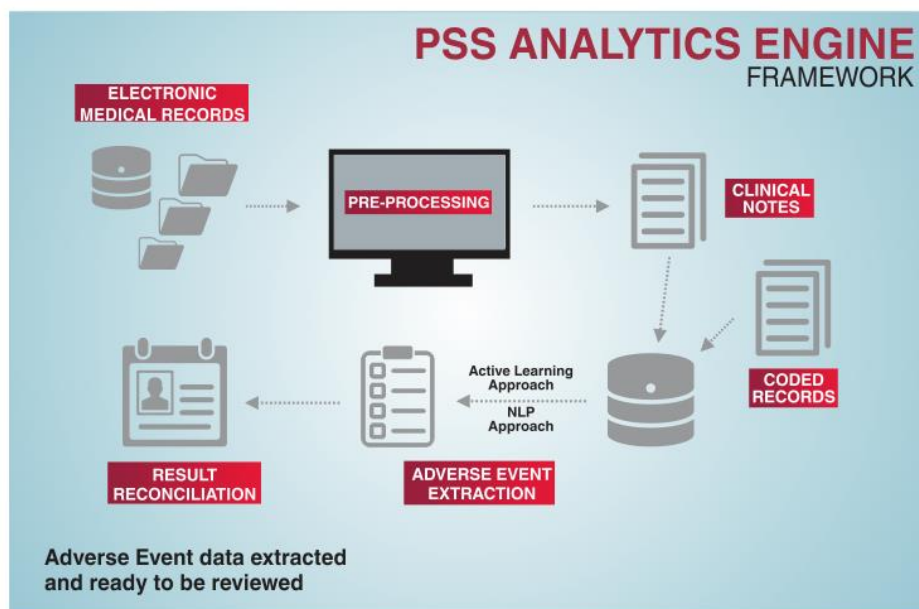
Now, the power of data is moving beyond how we manage healthcare to how we improve it.

The desire for all healthcare organizations is to reduce harm to patients.

However, in order to reduce harm, you first have to find it.

*Welcome to the world of trigger tools.*

<sup>1</sup> Jha et al, 2013 in Free from Harm Accelerating Patient Safety Improvement Fifteen Years After To Err Is Human, National Patient Safety Foundation, December 2015.



#### KEY BENEFITS

- Provides a comprehensive view of possible adverse events that can be classified and reported
- Allows patient safety efforts to focus on the most common and/or serious adverse events
- Enables an organization's rate of harm to be tracked over time; less harm means fewer complications, better care and lower costs
- Improves sustainability through continuous improvement as harm is identified, analyzed and further reduced with each iteration
- Allows safety interventions to be tracked to determine if process changes result in improvements

#### The value

**Improved care quality prevents complications associated with adverse events, reducing costs at the same time.**

The GTT identifies adverse events that are not detected by other methods. Once identified and classified, this information can be used to foster continuous improvement:

- Collated and aggregated patient safety data can be included as part of regular process improvement initiatives, policy changes and learning and development activities.
- The rate of harm can be measured over time, assisting to evaluate the impact of process and practice changes that are undertaken.

#### Reduced litigation and insurance costs

Over time, fewer adverse events and related complications reduce litigation and insurance costs, raising an organization's profile as a quality organization.

#### Appropriate use of skilled resources

For organizations using the GTT manually, automating the detection of triggers will reduce the effort required for chart review, saving skilled clinical resources, reducing labor costs, and enabling the appropriate use of provider skillsets.

#### Innovation

Advanced predictive and prescriptive analytics can be applied to our rules engines and ontologies to improve care quality in areas such as:

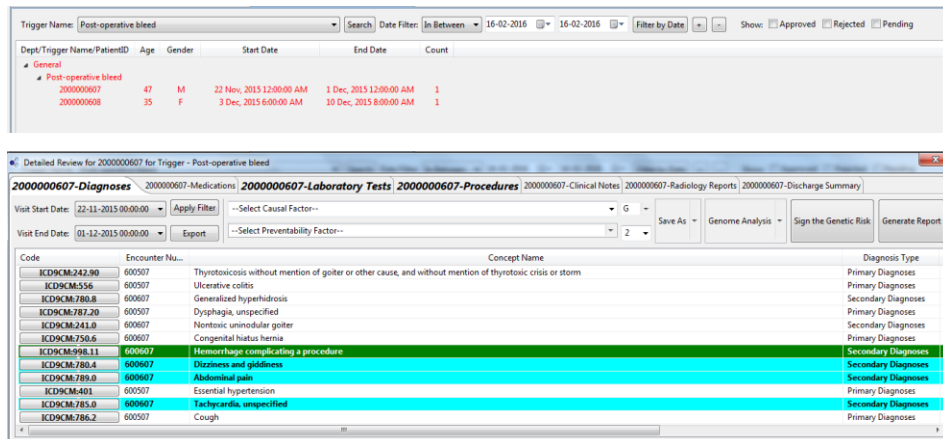
- Real-time identification of triggers – identifying potential problems which allow care teams to intervene before adverse events occur
- Patient safety decision support – contrasting patient and disease course characteristics against other known organizational and industry norms to choose the best and safest course of treatment for patients with complex health problems

*Automating adverse event detection – using data to make a difference*

- Identifying previously unknown patient safety opportunities through application of NLP to big data sources

### Support for accountable care practices, functions and reporting

Trigger tool automation provides evidence that contributes to patient safety and quality programs through reporting of care outcomes such as readmissions, unplanned admissions, and their relation to both adverse events and use of clinical pathways. Organizations can achieve program savings as part of IHI Triple Aim objectives<sup>2</sup> and demonstrate these improvements through measurement.



The screenshot shows a software interface for trigger tool automation. The top section displays a search for 'Post-operative bleed' with filters for date range (10-02-2016 to 10-02-2016) and options to show approved, rejected, or pending results. Below this is a table of patient data:

Dept/Trigger Name/PatientID	Age	Gender	Start Date	End Date	Count
2000000607	47	M	22 Nov, 2015 12:00:00 AM	1 Dec, 2015 12:00:00 AM	1
2000000608	35	F	3 Dec, 2015 6:00:00 AM	10 Dec, 2015 6:00:00 AM	1

The bottom section shows a 'Detailed Review for 2000000607 for Trigger - Post-operative bleed'. It includes tabs for Diagnoses, Medications, Laboratory Tests, Procedures, Clinical Notes, Radiology Reports, and Discharge Summary. The 'Diagnoses' tab is active, showing a list of ICD9CM codes and their corresponding concept names and diagnosis types:

Code	Encounter No.	Concept Name	Diagnosis Type
ICD9CM242.90	600507	Thyrotosis without mention of goiter or other cause, and without mention of thyrotic crisis or storm	Primary Diagnoses
ICD9CM556	600507	Ulcerative colitis	Primary Diagnoses
ICD9CM780.8	600607	Generalized hyperhidrosis	Secondary Diagnoses
ICD9CM787.20	600507	Dysphagia, unspecified	Primary Diagnoses
ICD9CM241.8	600607	Nontoxic unilateral goiter	Secondary Diagnoses
ICD9CM750.6	600607	Congenital hiatus hernia	Primary Diagnoses
ICD9CM998.11	600607	Hemorrhage complicating a procedure	Secondary Diagnoses
ICD9CM780.4	600607	Dizziness and giddiness	Secondary Diagnoses
ICD9CM789.0	600607	Abdominal pain	Secondary Diagnoses
ICD9CM401	600507	Essential hypertension	Primary Diagnoses
ICD9CM781.0	600607	Tachycardia, unspecified	Secondary Diagnoses
ICD9CM786.2	600507	Cough	Primary Diagnoses

### Meaningful use of health IT

Patient safety domain indicators can be automated using trigger tool automation software. We can also support medication measures that address the detection and prevention of adverse medication-related patient safety events.

### Be part of an innovative patient safety journey

CGI is improving the speed and accuracy with which adverse events are detected. While traditional voluntary reporting systems provide one source of information, the Patient Safety Service uses all of the clinical data assets at your disposal. And, in doing so, it allows you to identify adverse events you did not even know about.

### PATIENT SAFETY REFERENCES

#### World Health Organization

[http://www.who.int/features/factfiles/patient\\_safety/patient\\_safety\\_facts/en/index1.html](http://www.who.int/features/factfiles/patient_safety/patient_safety_facts/en/index1.html)

#### National Patient Safety Institute

<http://www.npsf.org/>

#### Canadian Patient Safety Institute

<http://www.patientsafetyinstitute.ca/en/Pages/default.aspx>

#### Institute for Healthcare Improvement

Griffin FA, Resar RK. IHI Global Trigger Tool for Measuring Adverse Events (Second Edition). IHI Innovation Series white paper. Cambridge, MA: Institute for Healthcare Improvement; 2009. Available on [www.IHI.org](http://www.IHI.org).

<sup>2</sup> <http://www.ihl.org/engage/initiatives/tripleaim/Pages/default.aspx>

### ABOUT CGI

Founded in 1976, CGI is one of the largest IT and business process services providers in the world, delivering high-quality business consulting, systems integration and managed services. With a deep commitment to providing innovative services and solutions, CGI has an industry-leading track record of delivering 95% of projects on time and within budget, aligning our teams with clients' business strategies to achieve top-to-bottom line results.

*Once you know, you can act to improve processes and policies. And, when you make improvements, lives are saved.*

To schedule a discussion with a CGI health analytics expert, please contact [info@cgi.com](mailto:info@cgi.com)