

## Putting patients first

### Nordland Hospital Trust improves safety and reduces harm with analytics

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#### Abstract

Nordland Hospital Trust has made considerable progress in extracting valuable insights from data in electronic patient journals. Nordland Hospital Trust provides specialist health services for a population of more than 200,000 in the far north of Norway, where the distances are vast and treatment centers are few and far between.

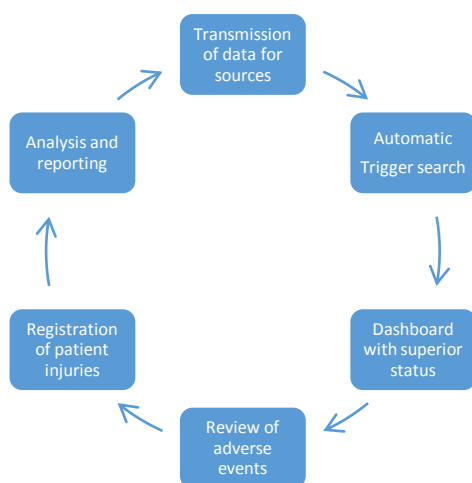
Since 2010 Nordland Hospital Trust has used the Global Trigger Tool (GTT) systematically in identifying adverse events in patient records. The GTT method is a retrospective review of a random sample of inpatient hospital records searching for “triggers” (or indicators of potential patient harm) to identify possible adverse events. Triggers range from being treated for an infection to suffering a pulmonary embolism while admitted to the hospital.

Nordland Hospital Trust is using SAS to automate the GTT-method to reveal and monitor the incidences of harmful adverse events related to medical care by the search of both structured and unstructured data within medical records.

The **SAS® Automated Trigger Analytics®** has the following main functionality:

- Automation of the process to reveal triggers for identifying harmful adverse events.
- Precise fulfill the GTT-method
- User-friendly registration of patient injuries in a web portal.
- Analysis and reporting for the purpose of follow-up triggers and patient injuries.
- Adding other functionality to the GTT-method
- Add proactivity to the work with patient safety in the Hospital

**Figure 1.** The work process with the **SAS® Automated Trigger Analytics®** software follows the natural workflow of the GTT teams



Today, all Norwegian hospitals have to manually review 240 inpatient hospital records per year using the GTT-method. This procedure is required by the national patient safety campaign. In Nordland Hospital Trust however, a total of 1680 reviews are done each year. The increased volume is done in order to elucidate patient harm in individual departments and clinics. This work is time- and resource consuming. By using **SAS® Automated Trigger Analytics®**, the goal is to save time on this GTT-analysis. In addition, the manual process is dependent on individual input. Thus the analysis is subject to possible human error. The SAS software, **SAS® Automated Trigger Analytics®** automates the work process to ensure that all hospital records can be searched objectively and with the same criteria. As a result, errors and search contrasts are kept to a minimum.

ASJ - Automatisert strukturert journalundersøkelse

Startside

Triggerrapporter

Skaderapporter

Driftsrapporter

Skaderegistrering

Skader siste 6 mnd

Antall innleggelser med minst 1 skade pr 201208.2

32

▲

Antall skader pr 1000 liggdøgnet pr 201208.2

7

▼

Skaderegistrering

Driftstatistikk

2013.03.18

Skadehistorikk

ASJ skadehistorikk, Nordlandssykehuset

Antall

25

20

15

10

5

0

1/10/20/30/40/50/60/70/80/90/100/110/120/130/140/150/160/170/180/190/200/210/220/230/240/250/260/270/280/290/300/310/320/330/340/350/360/370/380/390/400/410/420/430/440/450/460/470/480/490/500/510/520/530/540/550/560/570/580/590/600/610/620/630/640/650/660/670/680/690/700/710/720/730/740/750/760/770/780/790/800/810/820/830/840/850/860/870/880/890/900/910/920/930/940/950/960/970/980/990/1000/1010/1020/1030/1040/1050/1060/1070/1080/1090/1100/1110/1120/1130/1140/1150/1160/1170/1180/1190/1200/1210/1220/1230/1240/1250/1260/1270/1280/1290/1300/1310/1320/1330/1340/1350/1360/1370/1380/1390/1400/1410/1420/1430/1440/1450/1460/1470/1480/1490/1500/1510/1520/1530/1540/1550/1560/1570/1580/1590/1600/1610/1620/1630/1640/1650/1660/1670/1680/1690/1700/1710/1720/1730/1740/1750/1760/1770/1780/1790/1800/1810/1820/1830/1840/1850/1860/1870/1880/1890/1900/1910/1920/1930/1940/1950/1960/1970/1980/1990/2000/2010/2020/2030/2040/2050/2060/2070/2080/2090/2100/2110/2120/2130/2140/2150/2160/2170/2180/2190/2200/2210/2220/2230/2240/2250/2260/2270/2280/2290/2300/2310/2320/2330/2340/2350/2360/2370/2380/2390/2400/2410/2420/2430/2440/2450/2460/2470/2480/2490/2500/2510/2520/2530/2540/2550/2560/2570/2580/2590/2600/2610/2620/2630/2640/2650/2660/2670/2680/2690/2700/2710/2720/2730/2740/2750/2760/2770/2780/2790/2800/2810/2820/2830/2840/2850/2860/2870/2880/2890/2900/2910/2920/2930/2940/2950/2960/2970/2980/2990/3000/3010/3020/3030/3040/3050/3060/3070/3080/3090/3100/3110/3120/3130/3140/3150/3160/3170/3180/3190/3200/3210/3220/3230/3240/3250/3260/3270/3280/3290/3300/3310/3320/3330/3340/3350/3360/3370/3380/3390/3400/3410/3420/3430/3440/3450/3460/3470/3480/3490/3500/3510/3520/3530/3540/3550/3560/3570/3580/3590/3600/3610/3620/3630/3640/3650/3660/3670/3680/3690/3700/3710/3720/3730/3740/3750/3760/3770/3780/3790/3800/3810/3820/3830/3840/3850/3860/3870/3880/3890/3900/3910/3920/3930/3940/3950/3960/3970/3980/3990/4000/4010/4020/4030/4040/4050/4060/4070/4080/4090/4100/4110/4120/4130/4140/4150/4160/4170/4180/4190/4200/4210/4220/4230/4240/4250/4260/4270/4280/4290/4300/4310/4320/4330/4340/4350/4360/4370/4380/4390/4400/4410/4420/4430/4440/4450/4460/4470/4480/4490/4500/4510/4520/4530/4540/4550/4560/4570/4580/4590/4600/4610/4620/4630/4640/4650/4660/4670/4680/4690/4700/4710/4720/4730/4740/4750/4760/4770/4780/4790/4800/4810/4820/4830/4840/4850/4860/4870/4880/4890/4900/4910/4920/4930/4940/4950/4960/4970/4980/4990/5000/5010/5020/5030/5040/5050/5060/5070/5080/5090/5100/5110/5120/5130/5140/5150/5160/5170/5180/5190/5200/5210/5220/5230/5240/5250/5260/5270/5280/5290/5300/5310/5320/5330/5340/5350/5360/5370/5380/5390/5400/5410/5420/5430/5440/5450/5460/5470/5480/5490/5500/5510/5520/5530/5540/5550/5560/5570/5580/5590/5600/5610/5620/5630/5640/5650/5660/5670/5680/5690/5700/5710/5720/5730/5740/5750/5760/5770/5780/5790/5800/5810/5820/5830/5840/5850/5860/5870/5880/5890/5900/5910/5920/5930/5940/5950/5960/5970/5980/5990/6000/6010/6020/6030/6040/6050/6060/6070/6080/6090/6100/6110/6120/6130/6140/6150/6160/6170/6180/6190/6200/6210/6220/6230/6240/6250/6260/6270/6280/6290/6300/6310/6320/6330/6340/6350/6360/6370/6380/6390/6400/6410/6420/6430/6440/6450/6460/6470/6480/6490/6500/6510/6520/6530/6540/6550/6560/6570/6580/6590/6600/6610/6620/6630/6640/6650/6660/6670/6680/6690/6700/6710/6720/6730/6740/6750/6760/6770/6780/6790/6800/6810/6820/6830/6840/6850/6860/6870/6880/6890/6900/6910/6920/6930/6940/6950/6960/6970/6980/6990/7000/7010/7020/7030/7040/7050/7060/7070/7080/7090/7100/7110/7120/7130/7140/7150/7160/7170/7180/7190/7200/7210/7220/7230/7240/7250/7260/7270/7280/7290/7300/7310/7320/7330/7340/7350/7360/7370/7380/7390/7400/7410/7420/7430/7440/7450/7460/7470/7480/7490/7500/7510/7520/7530/7540/7550/7560/7570/

SAS can help to improve patient safety through the use of **SAS® Automated Trigger Analytics®**:

- SAS technology for text analysis is applied to medical records
- Automated search on structured and unstructured data
- A list of triggers is identified and presented for each patient in the sample. Based on the trigger result members of the GTT-teams (nurses and doctor) determine whether a harmful adverse event has occurred. Category of harm and classification of the adverse events is done in the portal of **SAS® Automated Trigger Analytics®**.
- All reports/statistics on the triggers and patient injuries are available at the portal of **SAS® Automated Trigger Analytics®**
- **SAS® Automated Trigger Analytics®** adheres to the GTT method
- **SAS® Automated Trigger Analytics®** contains additional functionality beyond the GTT method, such as reports on the possibility of patient injuries, types of harmful adverse events, triggers distributed by age, etc.

**Figure 3.** An example of a report showing the possibility of patient injuries in the **SAS® Automated Trigger Analytics®**



## Outcomes

Using SAS to automate the GTT-method, the Hospital was not only able to analyze a greater number of records over a given time; it was also able to make better use of staff time. With SAS we have developed **SAS® Automated Trigger Analytics®**, the very first, full-on automation of the GTT-method.

The **SAS® Automated Trigger Analytics®** solution enables hospital staff to focus on investigating already identified triggers for adverse events and patient injuries, rather than conducting time-consuming searches for triggers. The time saved can be used to find ways to prevent adverse events from happening and reoccur.

## Conclusion

Providing high-quality patient treatment across all Hospital units is of the utmost importance to Nordland Hospital Trust, whose work involves ensuring that all patients have safe hospital visits. Over the last 10 years, since the topic of patient safety first emerged worldwide, Nordland Hospital Trust has been keen to ensure that patients come first.

Now up and running in the hospital, the **SAS® Automated Trigger Analytics®** solution was developed with user friendliness in mind, as well as the hospital's specialized health services. Nordland Hospital Trust believes that far too many projects rely solely on technology.

## Recommended Reading

1. Resar RK, Rozich JD, Classen D. Methodology and rationale for the measurement of harm with trigger tools. *Quality and Safety in Health Care*. 2003;12 Suppl 2:39-45.
2. Classen DC, Lloyd RC, Provost L, Griffin FA, Resar R. Development and evaluation of the Institute for Healthcare Improvement Global Trigger Tool. *Journal of Patient Safety*. 2008 Sep; 4(3):169-177.
3. Introduction to Trigger Tools. Available at:  
<http://www.ihl.org/IHI/Topics/PatientSafety/SafetyGeneral/Tools/IntrotoTriggerToolsforIdentifyingAE.htm>.

## Contact Information

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