Lean management in the Emergency Departement
Subproject Manchester Triage System
Lean Management in Pronto Soccorso

Mission of Emergency Department and Lean Management

- The role of the emergency department is to diagnose and treat acute and urgent illnesses and injuries.
- The role of Lean Management is the diagnosis and treatment of processes.
- The goal is to give healthcare professionals a new way to look at their processes using a small Lean toolset.
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Lean Production Strategy

• In a simple definition, we could say that lean thinking is: "A management strategy that aims to improve processes, create value and eliminate waste through standardization of processes and staff training".
Hospitals are under growing pressure

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A
Labour + Technology

B
Health care sector

C
Hospital

D
Patients
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CURRENT SITUATION
Challenges and drivers in the healthcare sector

- Growing **competition and cost pressure**
- Growing **bureaucracy**
- **Demographic change** and rising long-term care
- Increasing requirements on working **efficiency** and **productivity**
- **Limited resources** (staff, capital,...)
- **Time pressure** and call for **shorter treatment and residence times**
- Rising **health awareness**
Hospital Waste

Without Lean

With Lean

Waste

Waste
La follia sta facendo la stessa cosa più e più volte e aspettandosi risultati diversi.
The road is clear for a new beginning
Projekt
Lean Healthcare
2013
Pilotphase Erste Hilfe
Objectives of the Lean Healthcare / Lean Hospital multiannual program

• Satisfied patients
• Higher level of quality and safety: fewer mistakes, accidents, errors, so that the processing times and the length of stay will be reduced
• Improved availability of services: achieving better health care in a short time by optimizing care processes, workflows and interfaces
• Improved performance: visible performance, avoidance of duplication, faster turnaround times and more transparent costs through integration of IT systems, streamlining of administrative processes, reduction of waste, reduction of inventories and improvement of productivity;
The 5 Lean Principles

VALUE

VALUE STREAM

FLOW

PULL

PERFECTION

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Value: only 28% of the activities of a physician are for patient care
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Value: Value-adding activities make up only a small part of the work process

- Added value: 28%
- Waste: 72%
Lean workshop
Lean workshop – Value stream analysis
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Lean workshop – Value stream analysis
Value stream – code yellow

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DLZ: 159-259 Min
Wertsch: 79-129 Min (~50%)
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Checklist of results

- Management of patient paths (and waiting times)
- Planning and management of return patient flows (medication, wound inspections, ecc.)
- Integration of processes and systems with laboratory services
- Integration of processes and systems with Radiology services
- Identification of patients to improve safety and privacy
- Optimization of work scheduling and data coverage for Monitoring and Performance Management
- Optimization of structures and visual paths
SUB PROJECT MANCHESTER TRIAGE SYSTEM

Dr. Norbert Pfeifer
We don’t know what we don’t know
We can’t act what we don’t know
We won’t know until we search
We won’t search what we don’t question
We don’t question what we don’t measure
Hence, We just don’t know

Vision of Six Sigma - Anonymous
Sub project Manchester Triage System - Lean Instrument

Overcrowding
Sub project Manchester Triage System - Lean Instrument

Solutions?
1996 wurde die "GFT" (Gruppo interaziendale Toscano Triage) nach einer Serie von Arbeitstreffen zwischen Ärzten, Stationsleitungen und Pflegenden aus verschiedenen italienischen Regionen mit ihrem Sitz in der Republik San Marino gegründet.

In 2001 wurde die GITT (Gruppo interaziendale Toscano Triage) mit den 5 Farben rot, gelb, grün, blau und weiß (Dgrt n. 736/2001) gegründet. Wird derzeit nur regional eingesetzt ohne internationalen Standard.


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New strategies...?
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Solutions?

Initial situation → Objective → Preparation → Target modelling → Preparation for Implementation → Implementation
## Sub project Manchester Triage System - Lean Instrument

### The South Tyrolean “house of triage”

<table>
<thead>
<tr>
<th>Objective</th>
<th>Countrywide uniform and reliable triage</th>
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<tbody>
<tr>
<td></td>
<td><strong>Columns</strong></td>
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<tr>
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<td>Countrywide task force</td>
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<td>IT-System</td>
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<td>Initial and continuous education</td>
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<td>Quality control</td>
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<td></td>
<td>Guidelines / protocols</td>
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<td></td>
<td><strong>Basis</strong></td>
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<td></td>
<td>Triage-System</td>
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</table>
Selection criteria for MTS

- Improving communication
- Quality assurance
- 5-level approach
- Pain assessment
- Legal protection
- Risk minimising
- Reliability
- Results are communicable and comprehensible
- Standardization
- Controll of Treatment processes
- Symptom based
- Validity

Results are communicable and comprehensible.
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Preparation for implementation – Emergency-Pass
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The choice is clear: we choose the path of innovation
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Sub project Manchester Triage System - Lean Instrument
### Sub project Manchester Triage System - Lean Instrument

<table>
<thead>
<tr>
<th>ABCD (Air, Breath, ...)</th>
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<tbody>
<tr>
<td>PERSELLO ALESSANDRO (04.12.1973)</td>
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<tr>
<td>VIA PETRARCA 24 MERANO (Italy) Tel. 0473/449869</td>
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<table>
<thead>
<tr>
<th>Vic Aeree (Prima)</th>
<th>Respirazione (Prima)</th>
<th>Circolazione (Prima)</th>
<th>Coscienza (Prima)</th>
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<td>parz. ostruite</td>
<td>insufficiente</td>
<td>tachicardia</td>
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<td>ostruite</td>
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<td>risposta verbale</td>
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<td>aritmia</td>
<td>risposta al dolore</td>
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<td>asistolia</td>
<td>incosciente</td>
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</table>

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<th>Respirazione (Seconda)</th>
<th>Circolazione (Seconda)</th>
<th>Coscienza (Seconda)</th>
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Sub project Manchester Triage System - Lean Instrument
# Sub project Manchester Triage System - Lean Instrument

<table>
<thead>
<tr>
<th>Manchester Triage System</th>
<th>Pericolo</th>
<th>Senza preoccuparsi</th>
<th>Infiammazione</th>
<th>Lesione cutanea</th>
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<tbody>
<tr>
<td>Adulto e bambino</td>
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<td>Aggressione (collo di)</td>
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<td>Allergia</td>
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<td>Autointossicazione</td>
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<td>Comunicazione visiva</td>
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<td>Contatto con sostanze chimiche</td>
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<tr>
<td>Convulsione</td>
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<tr>
<td>Disordini e vomito</td>
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<td>Disfunzione negli adulti</td>
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<tr>
<td>Disfunzione nei bambini</td>
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<tr>
<td>Dolore cervicale</td>
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<td>Dolore addominali negli adulti</td>
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<td>Dolore addominali nei bambino</td>
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<tr>
<td>Eruzioni cutanee</td>
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</table>

**Risposte:**
- Via respirazione a raffreddo?
- Respiro insufficiente?
- Shock?
- Ipoglicemia?
- Convulsione persistente?
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Glasgow Coma Scale

**Apertura occhi**
1. Nessuna
2. Allo stimolo doloroso
3. Allo stimolo verbale
4. Spontanea

**Risposta motoria**
1. Nessuna risposta
2. Estensione allo stimolo doloroso
3. Anormale flessione allo stimolo doloroso
4. Flessione/ritrazione allo stimolo doloroso
5. Localizzazione dello stimolo doloroso
6. Obbedisce ai comandi

**Risposta verbale**
1. Nessun suono emesso
2. Suoni incomprensibili
3. Parla e pronuncia parole, ma incoerenti
4. Confusione, frasi sconnesse
5. Paziente orientato, conversazione appropriata

Score 4
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Sub project Manchester Triage System - Lean Instrument
Conclusion

Challenges are what make life interesting; overcoming them is what makes life meaningful

Joshua J. Marine
Lean Management in Pronto Soccorso

Kevin Mackway-Jones, Janet Marsden, Jill Windle

Manchester Triage System

Trad. di P. Solazzo, M. Prantl, G. Magnarelli
Casa Editrice Ambrosiana. Distribuzione esclusiva
Zanichelli
2017
Sub project Manchester Triage System - Lean Instrument

Gruppo Italiano Manchester Triage

http://www.manchestertriagesystemitalia.it
In order to prove the subjectivity of triage with data, 13 case studies were elaborated with different pathologies and severities. 32 nurses of 4 different South Tyrolean regions carried out a first assessment of the different pathologies by the assignment of different Codes.
The nurses were categorised as follows:
Triage-experience < 2 years
Triage-experience > 2 years
Each nurse evaluated all 13 case studies with one of the following codes:
- WHITE
- GREEN
- YELLOW
- RED
- NOT ASSESSABLE*
Internationally recognized 5-level triage-systems achieve reliability scores of 80-95% *

From 13 case studies to over 8 were assigned two or more different codes ➔ (green-yellow-red)

Quelle: Deutsches Ärzteblatt, Jg. 107, Heft 50 vom 17. Dezember 2010
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# Initial situation – results

<table>
<thead>
<tr>
<th>FALL</th>
<th>ROT</th>
<th>ORANGE</th>
<th>GELB</th>
<th>GRÜN</th>
<th>WEISS</th>
<th>RELIAB. FAKTOR</th>
<th>ANZAHL FARBEN</th>
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<td>17</td>
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<td>0</td>
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- **Average**: 82% 1,85
- **Reliability Score**: +15%
- **Number of Colours**: –30%

**Relevant Notes**

- A mixed score in the reliability of 100% is considered optimal.
- 30% reduction in the number of colors.

---

**Additional Information**

- The data was collected in a triage setting.
- The triage system was evaluated for its reliability and color count.

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**Visualization**

- A chart showing the color distribution across different scenarios.
- Icons representing the initial situation and results.
Analysis of common triage systems

- Trend towards internationally recognised **5-level-systems**.
- The aim of modern emergency department triage is to structure the severity of the emergency patient's illness, prioritize the treatment order, and assign patients to the appropriate treatment location.
- Five-level triage instruments are considered the gold standard in emergency clinical medicine.
- The Manchester Triage System (MTS) and the Emergency Severity Index (ESI) are already available in a German translation and are already used in various German emergency departments. The Italian translation is not yet available for no one of the mentioned triage systems.
- A validated 5-level triage system should also be introduced in South Tyrolean emergency departments in order to ensure, in particular at capacity bottlenecks, through a structured approach **countrywide high process reliability**.
Sub project Manchester Triage System - Lean Instrument

Results

Standardization and improvement of the reliability of the Triage due to the introduction of the new MTS Triage

• All the emergency units of the Province have adopted the MTS system
• MTS is internationally certified with 5 levels of urgency
• The evaluation of the patient is based on standardized protocols shared and recognized through a stable guided process
• Continuous and progressive review of the protocols
• Fewer mistakes and less pressure on triage
• More opportunities for verification and improvement of quality (systematic periodic audits)
• Comparability of structures
Results

Valorization of waiting time at the first visit and acceleration of patient paths

• For certain symptoms and levels of emergency validated internally and compliant from a legal medical point of view, they will allow the Triage to activate diagnostic and / or pain therapy useful to transform the waiting time to the first visit from pure waste to "non-value" but necessary time

• In other words: the physician will visit the patient for the first time with a basic diagnostic available, evaluating the opportunity to complete the patient's pathway with a single visit. Short throughput times, minor workload on the physicians (free up resources to speed up the pathway of other patients too).
Concrete recommendation of the TF to the operation management

- The task force "Triage" recommends after an extensive research the use of a scientifically and legally validated triage system with operational launch in June 2015.
- Within the task force, several systems have been analysed and tested about their applicability in South Tyrol.
- The Manchester Triage System (MTS) is a very good solution and was tested in the hospital of Merano as a pilot project from early May 2014 until the end of October 2014, with positive results regarding its applicability and will therefore be recommended by the Task Force as future South Tyrolean triage system.