

# REVIEWS PAPERS

## PREOPERATIVE EVALUATION; NEW ATTEMPT

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### 1. Introduction

There is about 19 million surgical (no-cardiac) operation in Europe every year, including 5.7 million of a high cardiovascular risk cases. 167,000 patients has faced cardiac problems which in 19,000 are life threatened complications (1). Using colloquial language it equal a disappearance of a small seaside town every year.

Accordance to ESC demographic changes will effect in 20% rise of the number of operation until 2020. However, the percentage of octogenarians will rise up 50%. So far 30% of patient have got a high cardiovascular risk (1). But due to the aging of the population it will rise significantly. Therefore preoperative treatment should change follow rising needs. In the presents of EBM there are news every days according to this topic. Successive revealed guidelines may support decisions, tests choices and optimal treatment. Unfortunately, their complication result in time consuming and makes their use difficult in “good medical practice” on a regular basis.

The key thing is an treatment optimization, which may rise the cost of treatment. Therefore, the is a need to change the treatment planing. Which must be focused on cost effec-

tiveness to balance available resources. There is not of our interest to present a currently use preoperative algorithm for non-cardiac patients, or ESC guidelines abbreviation. However, there are available on a web side of Polish Cardiological Society and we recommended those lecture of course. Our aim is to present a simple tool improving safety of the patient by adequate risk evaluation. Which eventually improves communication between surgeons, anesthetists and other internal medicine consultants – hereafter referred to as HELIOS Score.

### 2. How our daily practice of preoperative evaluation looks like?

Here are few often present phenomena:

- High risk patients hes been OFTEN not identify.
- No recommended standards available for high risk patients.
- The risk remains under or overestimated
- The question for additionally results or consultation by anesthetist become interpret as a attempt to “unnecessary drop from operation schedule” (nonsense!)

First author is an employee of HELIOS company where considered tool is in use

- Additionally results performed without indication.
- Additionally result without influence on the treatment.
- Additionally results not seen at all before surgery.
- Patients not informed about the risk of operation or alternative treatment.

Probably every honorable reader may add more points to this list based on own experience. The attempt we are suggesting gives a resolution to at least some of named above problems.

Moreover, the extra point is the criminal, civil and professional responsibility. If the treatment plan is adequate to indication, appropriate risk assessment performed and comprehensive information gives to the patient, the whole process is recognized as interdisciplinary attempt. Then is clear, even in case of death or severe complication, the situation was preliminary analyzed by the team of consultants, patient condition maximally optimized and the patient eventually signed consent form accepting the risk (2). This way appropriate preoperative evaluation reflect in a legal safety of clinician and the side.

### 3. Aims of preoperative evaluation

Evidence Based Medicine consist a criticism to all not scientifically confirm methods. So far not any clinical Trial were design to answer a question: is preoperative evaluation profitable or not (3). Which is similar to the question: is a parachute profitable whilst jumping out of airplane? Such a randomized Trial would be impossible due to ethical reason (4). Is it reasonable not to believe in sense of the scientifically unconfirmed method, even is observed as a good one? On the other hand adequate balance is always needed. The good example in such a matter is a paper from Wijeysunder et al. „Less is more”. In this trial from all 269,866 patients 38.8% achieved internal consultation affecting additionally consequence like: extra tests and cardiological interventions. Those actions increase the risk of early Death (RR 1.16 (CI 1.07-1.25); if express as odds ratio OR, results were even worse (5). Lets leave this without any comment.

We have no influence on primary risk owing patient's co-morbidities, but we can optimize

it in some cases using appropriate methods. Which are the patients and what are the methods? Preoperative evaluation answers those question. Moreover, push us also to consider treatment alternatives (conservative treatment, endovascular/mini invasive vs. open repair), choice of appropriate analgesia and postoperative care. Patient correctly informed about the risk might chance its decision, postpone or refuse the operation (3). Initial health status might deteriorate with each subsequent surgical intervention. In consequence the risk is rising and the prognosis worse. Therefore, preoperative evaluation must be performed each time the patient faced the surgery no matter how many time was operated during his hospital stay (6).

Evaluation starts whilst qualification for surgery (fig. 1). First the Surgeon explain to the patient what is the plan and what is the risk of a treatment. Second the anesthetist perform complete risk assessment including risk of the patient (owing co-morbidities and exercise capacity) and again risk of surgery. As present on figure 1 there is a need for a tool estimating personal risk in a certain surgery (predictive test/ Score). However, clinicians understanding the risk different way. In one study 77% of Doctors has estimate the risk without use any of the scoring tool, based only on theirs personal experience. In this study the risk was assessed as low if varies between 1 to 20%, moderate between 1 to 50% and high between 2% and 50% (3). Practically, patient should be informed precisely about the range of his risk. The best

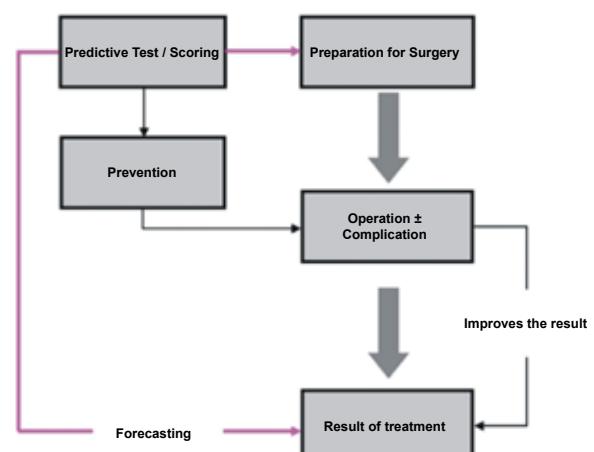


Fig. 1. Process of preoperative evaluation  
(source: G Theilmeier, SM Coldewey (2009): Perioperatives Risiko. In: Kochs u.a., Anästhesiologie, Georg Thieme Verlag KG)

in this matter is a confidence interval (CI) for personally calculated risk. Thus, patient should obtain information as follows: „The risk of Death for the surgery you going to face varies from 1.5% up to 1.8%”. Otherwise he remains confused more then before the visit.

Some of the authors recognize high risk patients if they got  $\geq 2$  risk factors in RCRI (Revised cardiac risk index wg Lee), which also equals  $>6.6\%$  risk of cardiac complications. Whereas, low risk patients are recognized if RCRI equals  $\leq 1$ , which also means risk of cardiac complication below  $< 1\%$ . It is a straight-dichotomous simplification facilitated daily practice (6, 7, 8). It is important to emphasize this is only all about cardiac events. However, the patient is interesting to get to know the entire risk of death and complication (not only the risk of Acute Coronary Syndromes). We will come back to this point in chapter 5.

Scoring accomplishment should recognize the high risk patients and must be follow by appropriate prevention. Although, if there is a time for (except emergency cases), prevention should improve patient health condition including cardiac deficiency.

However, according to our principal rules, additional action is taken only if it might change further treatment (6).

Using predictive test become a basic ESC recommendation in every pre assessment. Guidelines says: It is recommended to use clinical indicators to define operative risk. In such a matter using NSQIP or Lee Score are recommended (Class I, level B) (1).

In summary, preoperative evaluation is rational only if: might recognize high risk patients, preventive action possible to perform, optimization of health condition available (time and system limits). Hereby, death and complication rate reduction improve an early results. Evaluation halve all the patients. The high risk group must have additional test or consultation, but only if it might change further treatment. If those extra action do not change the plan of therapy, are simply decline. The other group (without high risk) do not require extra tests or consultation regardless of age.

#### 4. What tests we can use?

Detailed description particular scales goes beyond the frame of this paper. However, some

aspect are worth to focused on. In a large systematic review, published in Anesthesiology in 2013 authors analyzed 27 papers dedicated to 34 risk calculators from the last 30 years. It appears the predictive value (death and complication rating) of the complicated tools like P-POSSUM or NSQIP Surgical Risk Cal is only slightly over the simplest one eg.: RCRI or ASA-PS (AUC P-POSSUM: 0.92, AUC NSQIP: 0.958 vs. AUC RCRI: 0.731, AUC ASA-PS: 0.889)\* (9).

High complication ( $>30$  variable needed for calculating) limits their implementation in clinical practise. Therefore, the balance between precision and complication is recommended. Glance et. Al. presenting own risk calculators – SMPM (The Surgical Mortality Probability Model) assess by the way the rate of use in USA a very complicated, but also highly precise tool, called NSQIP Surgical Risk Calc. It appears, only 3% hospitalizations are using them, due to high cost of collecting data necessary to calculate the risk (10). Therefore, only simple and possible to use in every condition, without extra tests and computer support Scoring Tool, might be rational.

The background of the Helios Score is Revised Cardiac Risk Index (RCRI) published in 1999 by Lee et al. Primary RCRI was used to predict MACE (major adverse cardiac events), including cardiac arrest (asystole, PEA or VF), complete heart block, pulmonary edema and myocardial infarct. This tool shows good predictive value in most of the surgical fields except Vascular Surgery (where is lowering the real risk) (11). In Vascular Surgery it could be supported by especially dedicated tool called V-POSSUM. This one is for example integrated with Polish National Vascular Surgery Register – Krajowy Rejestr Operacji Naczyniowych (KRON), which will probably launch in 2016 in all Vascular Departments in Poland.

RCRI scale consist of six cardiopulmonary risk factors (tab. 1). High risk operation (eg.: open chest surgery), Ischemic Heart Disease (myocardial infarct in a Past Medical History),

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\* AUC (Area Under Curve) assess optimalsensitivity and specificity for calculated criterion (estimated for an examined scale). Simply speaking test assess the patient with and without complication. The value about 0.5 means lack of predictive value, 1- maximal predictive value of the test. The scale is considered as good if AUC exceed 0.8.

Table 1. RCRI scale consist of six cardiopulmonary risk factors (one point each). Summary of the points quality the patient to one of four risk classes

RCRI Revised Cardiac Risk Index	Punkty
High risky operation (eg.: open chest surgery)	1
Ishemic Heart Disease (myocardial infarct in a Past Medical History)	1
Circulatory Insufficiency (eg.: paroxysmal nocturnal dyspnea)	1
Cerebrovascular Accident in Past Medical History	1
Insulin-dependent Diabetes	1
Chronic Kidney Disease (kreatyinin >2 mg/dl; >177 µmol/l)	1

Circulatory Insufficiency (eg.: paroxysmal nocturnal dyspnea), Cerebrovascular Accident, Diabetes, Chronic Kidney Disease (keratin >2 mg/dl). Those are independent patient related risk factors (means: independently correlated in logistic and multifactorial regression).

Every risk factor equal one point. And the summary of all quality the patient to one of four risk classes. Risk of MACE equals respectively 0.4%, 0.9%, 6.6%, 11% for 0, 1, 2 i  $\geq 3$  points (fig. 2).

The limit of RCRI test was a low predictive value for all-case mortality. It is obvious because it does not take into account all non-cardiac reasons, which are responsible for over 60% of the early deaths (12). After five years from initial publishing of the RCRI Score, Boersman improve their predictive value by adding the age and surgery extensiveness (13). Profitable was also dividing the surgery exten-

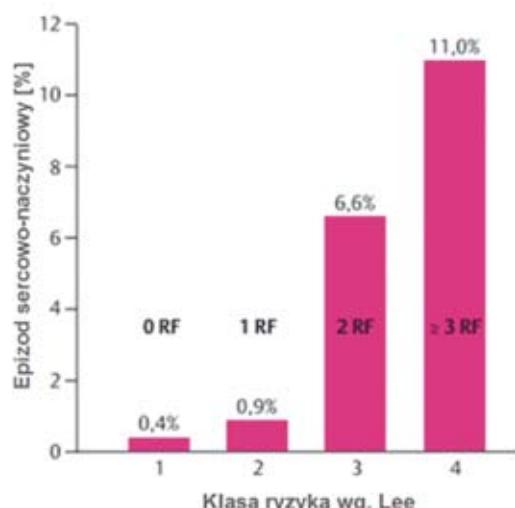


Fig. 2. MACE risk relation to the RCRI scale result  
(source: G Theilmeier, SM Coldevey 2009: Perioperatives Risiko. In: Kochs u.a., Anästhesiologie, Georg Thieme Verlag KG.)

siveness for more than two groups (rise of the C statistics -ROC, from 0.63 to 0.85).

The answer for this chapter title should be like Albert Einstein saying: „Everything should be made as simple as possible, but not simpler”. The good test should be then simple, objective and repeatable. It should respect patient risk (co-morbidities, physical capacity) and at least surgery extensiveness. Otherwise is useless.

## 5. Risk determinants.

All operative risk consist off:

- Risk of patient
  - present medical problem, trauma severity
  - comorbidities
  - decompression symptoms
  - physical capacity, age
- Risk of surgery
  - extensiveness
  - urgency
- Risk of analgesia (might be omitted because is very small)

Let consider old patient with resting dyspnea due to circulatory insufficiency, peripheral edema on maximal drug therapy. Moreover, this condition is stable from a years and there is a plan of cataract operation. So, we got high risk of the patient but low of the surgery. Hereby, is a high general/total risk on our matrix (fig. 3, moderate color ↑↓). The sec-

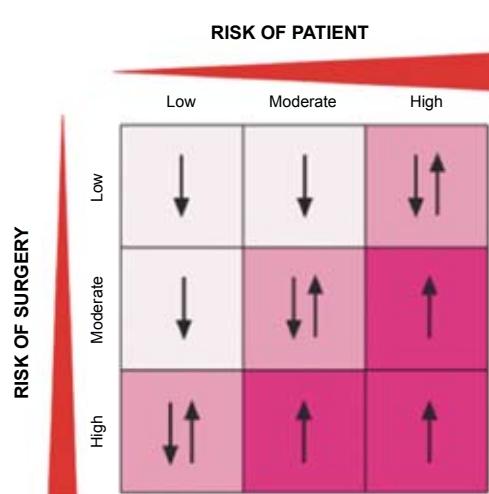


Fig. 3. Matrix of total risk  
(source: G Theilmeier, SM Coldevey 2009: Perioperatives Risiko. In: Kochs u.a., Anästhesiologie, Georg Thieme Verlag KG)

ond case is a young, fit male without co-morbidities planed for esophagus resection. This is oposit situation, but the total risk is equally high (moderate color- ↑↓).

Glance strongly confirm this relation (15). He present his own simple scale, called SMPM (Surgical Mortality Probability Model). It shows a rise of death rate in every ASA class, if the extension of the surgery is taken into account. There is big difference in a death rate between low and high risk surgery in IV ASA class (five time higher for high risk surgery) (fig. 4). Therefore, those two element should be assessed always together.

**Risk of the patient.** To assess it we taken into account the factors listed in RCRI Score (see chapter 4). Important condition in this matter is also decompensation. This alway need to improved or checked (consultation needed). ESC guidelines explain those as active cardiac conditions (ACC) (tab. 2).

The third element is physical capacity of the patient. Basic question: Has he any patient Reserve, Which can enabling on demand? Which flour he is able to get on foot? (What is DO<sub>2</sub> vs. VO<sub>2</sub>, Means oxygen supply to use ratio). Physical capacity decrease with age unwittingly Reducing patient activity. He believes he is still fit and active, although is using a car or a bike instead of the lift or steps. Therefore, objective attempt is needed. The good method is to check how many steps (which flour) patient can get without stoping. Achieving second flour means good physical capacity (> 4 MET Met metabolic equivalent), even though research shows little correlation with mortality (15). 1 MET is a use of oxygen in the rest (about 3.5 ml / kg / min). Full operations produce a multi-dimensional stress (especially in the postoperative phase), which causes an increase in oxygen consumption of 8-12 ml / kg / min, or 3-4 MET. Without the capacity to meet this minimum requirement mortality increases by about 30% (this applies mainly cardiac surgery) (15, 16).

Table 2. Active Cardiac Conditions

- Acute Circulatory Failure
- Unstable Angina
- Symptomatic Arrhythmias
- Symptomatic Valve Disease
- Fresh Myocardial Infarction

\*myocardial infarct within 30 days

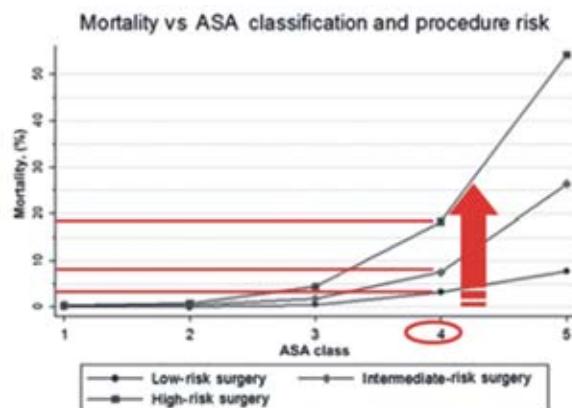


Fig. 4. Death rate and surgical risk rising simultaneously for equal ASA physical status

**Age.** Age is not a risk factor in all of scales, although in our opinion should be taken into consideration for the above reasons.

**Operational risk.** The operational risk assessment take into account the urgency and scope of the operation. The extent of the operation is related to its length, "displacement fluid" between spaces, rheological disorders, bleeding disorders, hypothermia, loss of blood (transfusion necessity and its negative impact), SIRS (system inflammatory response syndrome). All this affects the hemodynamic and the risk of cardiac complications and death from non-cardiovascular causes (17). The risk of emergency operations increases by an average 2.5 fold compared to planned (10, 18).

Operation association with specific group may change. The development of surgical techniques improves safety and can move the procedure to the lower risk group. Traditionally, however, a tendency to classify operations into three risk groups: high, medium and low, for whom the risk of cardiac events (MACE in terms of major adverse cardiac event within 30 days of surgery) amounts to > 5, 1-5 and < 1%. Sample operations contained in the table (tab. 3) are derived from the current ESC guidelines in 2014.

**The risk of anesthesia.** Back in the seventies the number of deaths due to errors caused by anesthesia was 300 per million. Currently is 30 ppm (i.e. less than 1 in 20,000) and still falling. For comparison in civil aviation in 2000, the number of fatal accidents per million flights was 6 and was reduced to 3 in 2009. We owe it to risk management programs and CRM (crew resource management), of which experience is increasingly used by modern anesthe-

Table 3. Example operation and the risk of MACE

Low risk: < 1%	Moderate risk: 1–5%	High risk: > 5%
Superficial surgery	Abdominal surgery: splenectomy, Oesophageal hernias surgery, Cholecystectomy, Symptomatic CEA or CAS.	Open Vascular surgery, Amputation, Thrombectomy in acute low limb ischemia, Duodenal and pancreas surgery. Liver resection, Bile duct surgery, Esophageal resection, Bowel perforation,
Brest	Endovascular angioplasty, EVAR, ENT surgery,	Suprarenal gland resection, total urin bladder resection, Pulmonectomy, Lung or Liver transplan.
Stomatology	Neurosurgery and Ortopedic large procedures: hip and vertebral surgery.	
Thyroid surgery	Urology and gynecology: large surgery.	
Ophthalmology	Kidney Transplantation, Small procedures in Thoracic Surgery	
Reconsructive surgery		
Asymptomatic CEA or CAS		
Gynecology: small procedures		
Ortopedic: small procedures (menisectomia)		
Urology: small procedures (TURP)		

siology. The risk of anesthesia can therefore be disregarded, assuming optimal method selection and proportionality experienced anesthesiologist to the severity of the patient's condition.

The preceding theoretical considerations help us understand the meaning and shape of the preoperative card containing the Helios Score.

## 6. Helios Score- how it's made?

Preoperative control card (see our version-Appendix 1) is now the standard, obligatory part of every operation. Using free reverse of it, we have added a preoperative card containing the Helios Score. In the purpose of the preoperative evaluation of each patient before each operation (fig. 5).

SKALA OCENY RYZYKA OKOŁOOPERACYJNEGO																	
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Imię:																	
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Fig. 5. Helios Score in the Polish version (the original available from the author)

The left column contains the risk factors associated with the patient (symptoms and diseases increasing risk). In the right column there are three groups of operations depending on cardiac risk.

The left column. Symptoms and diseases increasing risk are classified in four groups. The highest score (5 points) – high risk-receive states of acute (myocardial infarction, heart failure decompensation, other words-acute cardiac conditions) and states of reduced circulatory and respiratory performance (including patients with chronic lung disease). Three points – medium risk –reserved for patients with the presence of risk factors according to Lee. One point – low risk – elderly patients, lack of sinus rhythm. Zero points- patients without risk factors mentioned above. In each group separately included physical capacity.

The right column. High-risk operations receive 5 points, eg. a large operation in two body cavities, vascular reconstructions in acute ischemia of the lower limbs. Medium risk operations receive 3 points, for example nephrectomy, carotid endarterectomy. Two points are designed for low-risk operations, superficial, such as surgery of breast cancer, ophthalmology (tab. 3). Five points will also receive patients undergoing emergency surgery.

Both column right and left contain color-coded boxes (gray for the surgeon and green for the anesthesiologist) to fulfill assessed risks. The idea is that each of these two specialist asses the risk alone (fig. 6). The surgeon, as the treating physician, puts indication for the procedure and is the first to have conversation with the patient. He estimates the risk and informs the patient about the possible (surgical) complications, risks and alternatives. He fills the gray boxes. When then patients are sent to the anesthetist he assess the risk from his point of view. Also informs the

Fig. 6. The surgeon selects the estimated risk on the gray field, the anesthetist on the green field. Both fill the left and right side

patient about anesthesia options and risks. Then complete green boxes. This procedure is necessary that the patient could sign informed consent for treatment

If estimate of anesthesiologist and surgeon differ from each other, direct contact between them is required and the case is discussed in order to find a common solution, so legible signatures and phone numbers below list are important. This procedure encourages the exchange of constructive arguments in the process of preparing for surgery and is for the benefit of the patient.

Among the combinations of numbers from the columns left and right emerges eight grades of risk. They allow good differentiation of patients in three risk groups (marked in the colors of traffic lights) (fig. 7).

Score 2 to 5 assigns a patient to the "green" group. In this case, the qualification for the surgery is without further consultation. Patient receiving six points- a group of "yellow" – can be qualified for surgical operation without further consultation, if he is able to climb two floors without interruption, ie. he has a

SKALA RYZYKA >> SUMA PUNKTÓW OZNACZA RYZYKO OPERACYJNE									
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<input type="checkbox"/> NIE					<input type="checkbox"/> TAK				
KONSULTACJA INTERN.									

Fig. 7. Total Points from right and left column assign patients to one of eight risk classes. Here is the result marked of the final risk assessment (after consultation between disciplines, if preliminary estimates differ from each other)

good physical capacity and he has physical reserves that can be activated in the event of preoperative stress. The „red“ group contains patients with the total points over 7 (max. 10). The „red“ group means STOP! The patient requires greater preparation. It should be noted that number of risk factors according to Lee occurring in one patient does not change the score. Whether it's 1 or 4 factors, the patient receives 3 points. Further proceedings depends on the severity of the surgical operation and physical efficiency of the patient. To this group also goes patients in whom even in the way of presumption the physical capacity can not be determined (lying patients, patients with dementia).

In this part of the list there is also mention of two states that require a separate consultation of a internist / cardiologist because of very high risk and special procedure. It is a double block of blood plates and liver cirrhosis. See fig. 8 on the right.

Note that alone factors increasing the risk are not the cause of disqualification from surgical operation (fig. 8).

The overall risk always consists of patient risk and operational risk (see section 5). Even if this patient is to have an low-risk operation (eg. Ophthalmologic under local anesthesia), for which he would receive two points in the

<b>OBJAWY I CHOROBY PODWYZSZAJACE RYZYKO</b>		<b>OPERACJE PODWYZSZAJACE RYZYKO</b>
<b>WYSOKIE RYZYKO:</b> • Objawy niespecyficzne: - zatrzymanie dechu - zatrzymanie oddechu i koniugowacze - Zatrzymanie respiatoryzacji serca - Objawem zatrzymania rytmu - Czujki-wska podwyzszone od stresu (np. objawy przewlekłe, zmiany w napięciu mięśni, zmiany przy pokoleniu) = 1 punkt		<b>WYSOKIE RYZYKO, np.:</b> • Operacje niskie (trwające i transaktywacyjne > 70 lat) - Długi operacje rezumptywne, w szczególności operacje - Rekonstrukcja niszczonych obwodów przy całkowitym rozdzielaniu fortuny dolnej - Operacje z dużą utratą krwi - Operacje o dużej dyfuzji - Akty poziome
<b>SREDNIE RYZYKO:</b> • Przypadek (CCS II-III) - Przypadek dolegliwości - Objawy niespecyficzne - Objawy przewlekłe - Diabet - Niewydolność		<b>SREDNIE RYZYKO, np.:</b> • Operacja typu czystego
<b>NISKIE RYZYKO:</b> • Wiek < 70 lat - Brak objawów zatrzymania (np. migrena przewlekła) - Niedostępny biegacza (MM spad. > 180, skok. > 115 mmHg) - Uszkodzenie: uszkodzenie przy pokoleniu = 2 Punkty		<b>NISKIE RYZYKO, np.:</b> • Operacja antykoagulatoryczna - Endoskopia - Operacja przewlekła - Operacja okulistyczna - Operacja zębów - Akty poziome
<b>BRAK PODWYZSZONEGO RYZYKA:</b> • Brak objawów i chorób podwyzszających ryziko • Brak objawów i chorób podwyzszających ryziko		<b>KOMENTARZ DO DECYZJI:</b> Increasing risk symptoms and diseases ALONE are not a reason to not qualify a patient for surgery
<b>SKALA RYZYKA == SUMA PUNKTÓW ODNACZA RYZYKO OPERACYJNE</b> PROSTE ZAZNACZENI (PRZY ROZNIICY PUNKTÓW - KONSULTACJA)		
2    3    4    5    6    7    8    10		
DOPRZECZENIE DO OPERACJI DOPRZECZENIE DO OP. Gdy PACJENT MALE PUNKTY: > 3 PUNKTY		
PACJENT WYSOKEGO RYZYKA		

Fig. 8. A patient with acute myocardial infarction gets 5 points in the left column. Thus qualifying a group of „green“ he could have surgery. Would be this procedure correct? We have forgotten about something...

right column, the sum of points from both columns (in this case 7) would require prior medical consultation and further preparation or disqualified from surgery (fig. 9).

The last part of the list, concerns high risk patients. It includes elements that after done are marked with a cross. These are: an interdisciplinary discussion of the case, informing the patient about high risk and obtaining his agreement and the final qualification for the surgery with the signatures of specialists in specific fields (fig. 10).

Figure 11 shows an example of a correctly filled preoperative list on a fictitious patient. 75 year old Mr. Zbigniew C., must undergo knee prosthesis surgery. In medical history well-known is only compensated diabetes. Mr. Zbigniew controls glucose by his own and dispenses insulin. Every day he rides a bicycle, climbs the stairs on the 5th floor without a break (the building has no elevator). He receives 3 points from patient risk (diabetes) and 3 points from operational risk (knee prosthesis). In total 6 points = a group of “yellow”. As he is a man of athletic, he qualifies for surgery without further consultation.

In the case of high-risk patients (7 points or more), is the automatic internal medicine consultation. Doing so avoids unnecessary confrontation and unsubstantiated charges

<b>OBJAWY I CHOROBY PODWYZSZAJACE RYZYKO</b>		<b>OPERACJE PODWYZSZAJACE RYZYKO</b>
<b>WYSOKIE RYZYKO:</b> • Objawy niespecyficzne: - zatrzymanie dechu - zatrzymanie oddechu i koniugowacze - Zatrzymanie respiatoryzacji serca - Objawem zatrzymania rytmu - Czujki-wska podwyzszone od stresu (np. objawy przewlekłe, zmiany w napięciu mięśni, zmiany przy pokoleniu) = 1 punkt		<b>WYSOKIE RYZYKO, np.:</b> • Operacje niskie (trwające i transaktywacyjne > 70 lat) - Długi operacje rezumptywne, w szczególności operacje - Akty poziome
<b>SREDNIE RYZYKO:</b> • Przypadek (CCS II-III) - Przypadek dolegliwości - Objawy niespecyficzne - Objawy przewlekłe - Diabet - Niewydolność		<b>SREDNIE RYZYKO, np.:</b> • Operacje typu czystego - endoskopia - Długi operacje rezumptywne w chirurgii - Operacje z dużą utratą krwi - Plastyczne operacje brzuszne i krokskopowe - Operacje kośćci, kolana, kregiopis - Operacje przewlekłe - Operacje przewlekłe przy zatrzymaniu przewodowym - Akty poziome
<b>NISKIE RYZYKO:</b> • Wiek < 70 lat - Brak objawów zatrzymania (np. migrena przewlekła) - Niedostępny biegacza (MM spad. > 180, skok. > 115 mmHg) - Uszkodzenie: uszkodzenie przy pokoleniu = 2 Punkty		<b>NISKIE RYZYKO, np.:</b> • Operacja antykoagulatoryczna - Endoskopia - Operacja przewlekła - Operacje przewlekłe - Operacje typu czystego - Akty poziome
<b>BRAK PODWYZSZONEGO RYZYKA:</b> • Brak objawów i chorób podwyzszających ryziko • Brak objawów i chorób podwyzszających ryziko		<b>KOMENTARZ DO DECYZJI:</b> Only TOTAL points of patient risk and operational risk determines the process how to further proceed with the patient
<b>SKALA RYZYKA == SUMA PUNKTÓW ODNACZA RYZYKO OPERACYJNE</b> PROSTE ZAZNACZENI (PRZY ROZNIICY PUNKTÓW - KONSULTACJA)		
2    3    4    5    6    7    8    10		
DOPRZECZENIE DO OPERACJI DOPRZECZENIE DO OP. Gdy PACJENT MALE PUNKTY: > 2 Punkty		
PACJENT WYSOKEGO RYZYKA		

Fig. 9. Only TOTAL points of patient risk and operational risk determines the process how to further proceed with the patient

1. INTERDYSCYPLINARNE OMÓWIENIE PRZYPADKU	2. POMINOWANIE PACJENTA	3. KWALIFIKACJA DO OPERACJI	TAK	NIE
Data/Nazwisko/Tel. Podpis Anestezjologa	Data/Nazwisko/Tel. Podpis Chirurga			

Fig. 10. The last part of the list – completed only in patients with high risk

against the discipline that this consultation commissions.

The main question that we want to know the answer is tolerance and effort that brings with it operational stress. To what extent is it limited? Can it be improved before surgery? Can be the patient's condition optimized? And if so, by what kind of treatments? Besides that there must be a modification of drug therapy (beta-blockers, statins, anticoagulants, platelet blockers) and what is proposed post-operative care? How do we get answers to these questions and the problem of their proper selection (ergometer exercise test, test with dobutamine, cardio MRT, or echocardiography) are the domain of cardiologists.

In addition, the list is designed for a internist consultation (fig. 12). Its aim is to concretize and shortening recommendations. In many hospitals it is integrated with a computer system

and preoperative evaluation that serve obtaining complete and accurate records of patients.

We are aware of the differences between the systems in Poland and Germany. The right observation is the additional cost of introducing a new tool. However at this point we should remember the multi intentions of our western neighbors (and traditionally very thrifty) in the concept of described list. In the first place was placed patient safety and quality of medical care, immediately after costs reduction. Indeed- similar standards allow you to limit unnecessary spending while leaving a wide margin of discretion in decision-making process so that medicine remains an art.

The author can provide information and advice to interested of application and implementation of the described tools. The original preoperative cards available from the author.

## 7. Summary

Preoperative evaluation is not a simple, easy and pleasant task. It requires some experience, and in fact is done by young colleagues without a reasonably long training. Also for the more experienced colleagues, it is not occupation-like in the circumstances of lack of staff and increasing workloads. Under such conditions it is easy to oversights and errors. In proportion to the quality decreases patient safety. In aviation way to overload and routine became the various checklists. Medicine use these experiences. List of preoperative HELIOS was a tool for limiting the number of cases' errors in the premedication process. After the trial period we made a survey among doctors. Over 80% were satisfied and define the list as helpful (fig. 13). In hospitals which are in phase of design and development of in hospital web we recommend a integrating tool for standardizing processes of premedication

<b>WYPEŁNIA ANESTEZJOLOG</b>	<b>WYPEŁNIA CHIRURG</b>								
<b>OCIĄŻY I CHOROBY PODWIĘZSZAJĄCE RYZYKO</b>	<b>OPERACJE PODWIĘZSZAJĄCE RYZYKO</b>								
<b>WYSOKIE RYZYKO:</b> • Czereń zębowy wieku: - dzieci temu do = 35 r.ros - angina w spoczynku i przy niskim wysiłku - infarkt mięśnia serca w ostatnich 6 miesiącach - Objawowe zaburzenia rytmu - Czartera wieły zastępstwo od stycznia 1990- - Wzmacnianie serca w dniu operacyjnym - Wzmacnianie przy aktywności > 1 godz.	<b>WYSOKIE RYZYKO, np.:</b> • Operacja na głosie / tracheotomia / wiek > 70 lat • Dwie operacje naczyń wascjalnych w szczegółowości operacji na serce • Wzmacnianie naczyń obwodowych przy całkowitym nadciśnieniu kończyny dolnej • Operacja z dala od serca • Dwie operacje onkologiczne • Dwie poddanie								
<b>SREDNIE RYZYKO:</b> • Angina pokojowa (CCS II-III) • Stwierdzona zmiana w naczyńach • Zatrzymywana niewydolność serca lub dekompenzacja w wysiłku • Stwierdzona zmiana w naczyńach • Niewydolność serca • Dobieszczenie miedzi • Niewydolność nerek (BUN > 1,4 mg/dl) • Zmniejszona kąpielnica przy polowańcu < 2 razy	<b>SREDNIE RYZYKO, np.:</b> • Operacja tarczycy i/ lub - stan zwiększonego ryzyka • Dwie operacje onkologiczne w ciągu - szczególnego czasu • Wzmacnianie naczyń wascjalnych i nadciśnieniu • Operacja kręgosłupa, krtani, kropelki • Pierwsza operacja miedzi • Wzmacnianie naczyń/naczyni przy zmianach - wieku • Sztuczne								
<b>NISKIE RYZYKO:</b> • wiek > 70 lat • Brak rytmu zastępstw (n.p. migotanie przewrotkowe) • Nadciśnienie tętnicze • BMI > 100, zw. > 110 kg/m <sup>2</sup> • Niedopuszczalna kąpielnica przy polowańcu < 2 razy	<b>NISKIE RYZYKO, np.:</b> • Operacja endokriniyczna • Operacja przewrotkowa • Operacja okulistyczna • Operacja zębów • Sztuczne								
<b>BRAK PODWIĘZSZONEGO RYZYKA:</b>	<b>KOMENTARZ DO DECYZJI:</b>								
<b>0</b>									
Data/Nazwisko/Tel. Podpis Anestezjologa	Data/Nazwisko/Tel. Podpis Chirurga								
Dr. P. Pietrzyk, 12373	Dr. Mamoń, 13550								
<b>SKALA RYZYKA – SUMA PUNKTÓW OZNACZA RYZYKO OPERACJI</b>									
<b>PROSZE ZAZNAĆ (PRZY KONIECZNYCH PUNKTÓW – KONSULTACJA)</b>									
<table border="1"> <tr> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>X</td> <td>7</td> <td>8</td> <td>10</td> </tr> </table>		2	3	4	5	X	7	8	10
2	3	4	5	X	7	8	10		
<b>DOPRZECZENIE DO OPERACJI</b>									
<b>PACJENT WYSOKOGO RYZYKA</b>									
<b>SPROSTOWAŻENIE DO DRUGI PACJENT WYSOKOGO RYZYKA</b>									
<b>1. INTERDYSCYPLINARNE OMÓWIENIE PRZYPADKU</b>									
<b>2. POMINOWANIE PACJENTA</b>									
<b>3. KWALIFIKACJA DO OPERACJI</b>									
Data/Nazwisko/Tel. Podpis Anestezjologa	Data/Nazwisko/Tel. Podpis Chirurga								

Fig. 11. Sample list of preoperative Mr. Zbigniew C

The form is a template for a preoperative consultation. It includes sections for:

- DANE PACJENTA:** Name, Surname, Date of birth.
- KONSULTACJA PRZEDOPERACYJNA:** Logo of the hospital.
- RYZYKO OPERACYJNE wg. KARTY PRZEDOPERACYJNEJ:** Fields for assessing surgical risk based on the ASA classification.
- WYNIAD / PLANOWANA OPERACJA:** Details of the planned surgery.
- DATA / PODPIS:** Date and signature.
- NADWISKO / NR. TEL. ZAKOMPLIKUJACEGO KONSULTACJE:** Contact information for complications.
- OSZACOWANIE REZERW / WYDOLNOŚCI W CZASIE OPERACJI:** Fields for assessing reserves and endurance.
- BADANIE:** Examination results.
- DIAKOGDA:** Date of follow-up.
- CZY WYDOLNOŚĆ MOŻE BYĆ POPRAWIONA PRZED OPERACJĄ PRZEZ KONKRETNE CZYNNOŚCI?** Options for improving endurance.
- KARMADOTERAPIA OKOŁOOPERACYJNA:** Options include beta-blockers, statins, blood pressure stabilizers.
- PROPONOWANA OPERA PÓDOPERACYJNA:** Options include monitoring, EKG, specific laboratory tests.
- DATA / PODPIS:** Date and signature.
- NADWISKO / NR TELEFONU:** Contact information.

Fig. 12. Consultation Chart

**Main statements:****Preoperative evaluation:**

- Operational risk = risk of anesthesia + patient risk + surgical risk
- Determinants of risk associated with the patient are risk factors by Lee and overall output of organism

- Determinants of surgical operations risk are urgency (sudden / planned) and range of operation (<1, 1-5, > 5%)
- Preoperative evaluation is an interdisciplinary task
- The basic question: which of the factors can we improve?
- The patient should be properly informed of the risks and alternatives. The patient shares with us the responsibility of decision-making.  
Good risk score:
  - Clinically Oriented
  - Includes objective criteria
  - Sets the risk of death, complications and the individual forecasts
  - It takes into account factors related to the patient, capacity of the patient and surgical factors
  - Possible to use in all conditions and at any time
  - No additional tests, unplugged
  - Repeatable

Thank you, Professor Jochen Strauss, the head of a working group on pediatric anesthesia and the head of the Department of Anesthesiology HELIOS Klinikum Berlin-Buch. Thank you, Mr. Dr. Gerald Burgard, the head of the Department of Anesthesiology of Erfurt. They are the creators of described tools and the pioneers of clinical anesthesiology safety system in Germany. They embraced with joy the idea of promoting the principles of quality on a large scale outside the country, not claiming any copyright of described in this article preoperative list.

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