Le decisioni degli infermieri in chirurgia: quali differenze tra infermiere novizio ed esperto?

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Riassunto

Introduzione: la presa di decisioni è l’ultima fase di un processo che prevede la comprensione del problema, l’analisi dei risultati possibili sul paziente e l’attuazione dell’intervento che viene ritenuto più idoneo. Secondo alcuni autori, il ragionamento clinico tra infermieri esperti e novizi è differente. La finalità è quella di evidenziare le differenze nel decision making tra infermiere novizio ed esperto in chirurgia.

Materiali e metodi: è stato effettuato uno studio pilota nell’Azienda Ospedaliero-Universitaria di Udine: il disegno di studio è descrittivo, l’approccio è sia qualitativo che quantitativo. Lo strumento utilizzato è un caso simulato. Per validare il caso è stato scelto un infermiere esperto.

Risultati: le problematiche individuate dagli esperti sono state in media 5.7 (4-8) e 7.5 (3-13) tra i novizi. Gli esperti, su un possibile problema cardiaco postoperatorio, per il monitoraggio individuano la frequenza cardiaca mentre il neoassunto individua anche la pressione arteriosa. La decisione relativa al monitoraggio della glicemia, in seguito ad una sintomatologia compatibile con il diabete, è stata la stessa per i due gruppi.

Clinical decision making of surgical nurses: the differences between novices and experts

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Abstract

Introduction: decision making is the last step of a process which entails problem comprehension, possible results and the choice of a course of action deemed to be the most suitable for the patients. According to some authors, novice and expert nurses differ in their clinical reasoning.

Aim: to highlight the differences between the decision making processes of novice and expert nurses in the surgical department.

Materials and methods: a pilot study conducted in the University Hospital of Udine. The study design is descriptive and a written simulated case served as instrument. An expert nurse reviewed the validity of the case.

Results: the cues diagnosed by the expert nurses were on average 5.7 (4-8) and 7.5 (3-13) among the novices. For a possible postoperative heart problem, experts assessed the heart rate while novices also measured the blood pressure. 100% of experts and novices in relation decided to monitor glucose levels following the appearance of symptoms compatible with diabetes.
bile with an episodic hypoglycemic event, it was observed in 100% of cases among experts and novices; however, the novices added the administration of serial glucosticks [25% (1/4)]; after which 30% (3/10) of the experts would not have called the doctor, but would have continued to observe the patient, while 100% (4/4) of the novices would have made sure that the physician checked on the patient.

**Discussion:** in our study, the expert nurses identified a lower number of problems than the novices did, but these were qualitatively more specific and closely related to the patient's clinical situation. The experts made proactive decisions while the novices called the doctor and then focused on the patient's situation.

**Conclusions:** the findings of this pilot study evidenced that expert nurses are faster in diagnosing the patient's situation and in making decisions.

**Keywords:** Decision making, Novice, Expert, Clinical reasoning.

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**Introduction**

Decision making is the capacity to make clinical decisions concerning a patient. This ability, according to literature, has a great impact on the quality of nursing care. The various phases of clinical reasoning are:

1. gathering of clinical information,
2. drawing tentative hypotheses of the patient's situation,
3. interpreting data in view of the hypotheses made, and gathering further information to be used to validate or discard them,
4. comprehension of the problem,
4) making decisions to resolve the problem in light of an assessment of various evidence-based possibilities.²

**Basic theories on decision making**

Literature presents various theories that describe the cognitive mechanism of clinical reasoning. One of the most striking is the hypothetic-deductive theory which affirms that clinical reasoning is formulated on the basis of induction⁴⁵⁶⁷⁸⁹, and part of a continuous and simultaneous process of data gathering and analysis, which, in our particular case study, moves from a specific aspect towards a general one and involves our know-how and experience. The aim of this process is to confirm or eliminate the various assumptions made.

The information process theory¹⁰ acknowledges the elements of declarative memory as the main components in the cognitive process that leads to the decision making: procedural memory (both of which are part of long-term memory) and short-term memory. Declarative (explicit) memory involves all the information gathered in a previous stage and can be recalled, while procedural (implicit) memory encloses that type of unconscious knowledge which is rapidly and automatically applied and is built on experience. Short-term memory receives the information from the external world, and is processed by the declarative and procedural memory: the first analyzes information in a controlled manner, while the second does the same in an automatic way, and is thus faster.

At the turn of the 1990s a third theory came to light, based on the “cognitive continuum theory” (CCT) developed by Hammond¹¹, which affirms that analysis and intuition are not separate aspects of the cognitive process, but the starting and final point of the elaboration of information. The greater propensity towards analysis or intuition depends on the complexity of the task: the more structured and defined it is, the more the clinical reasoning process will tend towards analysis, and vice versa.¹²¹³

**Expert and novice nurses**

Patricia Benner¹⁴ studied how knowledge is incorporated with professional practice. She made use of the Dreyfus the-
sa della teoria di Dreyfus che descrive cinque differenti livelli di acquisizione “dell’abilità professionale”: il novizio, il principiante avanzato, il competente, l’abile e l’esperto. Un professionista si muove progradendo in senso crescente da un livello all’altro grazie all’esperienza in campo professionale, alla formazione, alla conoscenza sviluppata durante la pratica professionale e alla progressione nella carriera.15

Benner descrive i vari livelli riflettendo i cambiamenti che avvengono nella lettura, interpretazione e decisioni nella pratica clinica infermieristica. Il passaggio da un livello ad un altro avviene in tre specifici ambiti: la conoscenza, la visione della situazione e la percezione di se stessi. Nella fase iniziale il professionista ha una cieca fiducia nella “teoria” ma si procede poi verso uno studio in cui la conoscenza è diventata “intuitiva”; la “coscienza intuitiva o tacita” così come è stata definita deriva dal fatto che nozioni, conoscenze, principi teorici, relazioni causali tra variabili sono state messe alla prova, applicate, confermate e disconfermate.16 L’interpretazione della situazione che il professionista sta vivendo è inizialmente frammentata; il principiante legge molti elementi tra loro disgiunti, trova poiché si concentra subito sul problema e sulla decisione che pensa di dover prendere. L’esperto invece percepisce la situazione come unitaria e distingue nell’insieme gli elementi, pochi, ma rilevanti. La percezione di se stessi inoltre è estremamente significativa: all’inizio il professionista si percepisce come un’entità separata dalla situazione perché è concentrato sulla comprensione del problema e sulla decisione che pensa di dover prendere. L’esperto invece che osservatore distaccato.17 In letteratura emerge che c’è una differenza sostanziale nella presa di decisioni tra infermiere novizio ed esperto; queste differenze sembrano dovute a un diverso modo di operare della memoria. Reischman e Yarandi18, sulla base della teoria dell’information process, affermano che l’infermiere novizio utilizza la “fase dichiarativa” nella presa di decisioni mentre l’esperto la “fase procedurale”. Il novizio quindi analizzerà le informazioni nella porzione della memoria dichiarativa facendo riferimento a conoscenze teoriche: ciò richiede uno sforzo cosciente ed è un processo considerevolmen-

ory which describes five distinct “professional ability” acquisition stages: novice, competence, proficiency, expertise and mastery. A professional develops by progressing from one level to the other due to experience gathered in the professional field, and through training and know-how developed during professional practice and career advancement.15

Benner describes the various levels, noting the changes that occur in the reading, interpretation, and decisions made in clinical practice. The transition from one level to another takes place within three specific scopes: knowledge, situational perception and self-awareness. At the initial phase, the practitioner blindly sticks to the rules of “theory” but then proceeds towards the stage in which know-how becomes “intuitive” or “tacit” knowledge arising from the fact that notions, knowledge, theoretic principles, and cause relationships between variables are put to the test, applied, confirmed or disproved.16 At the start the practitioner interprets situational experience in a fragmented manner; the novice interprets many detached elements, finds very few connections between them, and finds it difficult to make discretionary judgments. An expert instead has a holistic perception of situations and distinguishes the few but important elements as a whole. Self-perception is furthermore significant: at the start the practitioner sees himself as detached from the situation because he is focused on the comprehension of the problem and the decision he has to make. The expert immediately focuses on the problem and the decision which is often a vision of what is possible and at times unexplainable, but is part of an underlying knowledge that is part of one’s tacit knowledge; it is precisely due to this that it forms an essential part of the situation he is undergoing and in which he is an involved actor, and not a detached observer.17 Literature points out that there are substantial differences in the decision making processes of novices and experts and these differences seem to arise from the memory’s different functioning modes. Reischman and Yarandi,18 on the basis of the information process theory, affirm that the novice nurse uses the “declarative phase” when making decisions whereas the expert uses the “procedural phase.”

The novice therefore analyses information in that part of the declarative memory and traces back to theoretical knowledge: this entails a conscious effort and is a considerably slow
On the contrary, the expert decides to analyse only relevant information and combines them with theoretical and experiential knowledge in a fast and automatic manner; all this occurs in the procedural memory area. The information is structured “in groups.” In this way the groups are perceived as sole information (“ceppo”) in such a way as to render the interpretation process extremely efficient. This operational mode of the memory also has an influence on nursing practice. Prowse and Lyne and Hardy et al. define the expert nurse as one who possesses effective observation abilities that allow him to note at an early stage the clinical changes in a patient and prevent some complications, unlike the novice nurse who does not communicate these variations until the problem is clear, thus delaying possible preventive interventions.

Therefore, there is a substantial difference in the way experts and novices approach a problem and the decision making process; the experts act in a proactive way gathering information and anticipating the problems whereas the novices act in a reactive manner. Literature presents contrasting results with respect to the quantity and quality of data gathered and the assumptions formulated by experts and novices. According to some authors, the expert nurses are more precise in comprehending the problem, make less assumptions and gather essential data to confirm or discard them; the novice nurses instead find it hard to comprehend the problem since they have a lot of information and are unable to categorize them in order of importance. White et al. and Hoffman et al. affirm that the expert nurses are those who gather more information. The discussion probably concerns the data found and not the focus: the expert gathers a lot of data and focuses only on some whereas the novice gathers a lot of data but his attention tends to lose sight of the important ones.

The objective of this pilot study was to analyse the decision making abilities of the novice and expert nurses in the surgery department. Particularly, the questions were:

1. Do the problems evidenced by the expert and the novice differ from the viewpoint of quality and quantity? What are the differences?
2. Do the possible causes of a problem differ (qualitatively and quantitatively) between novices and experts? Are
the parameters considered in monitoring the onset of the problem or its worsening the same between the two categories of nurses? 

3. Is there a difference between the amount of data which the novice or expert nurse considers to monitor the onset of a real or potential problem of the patient? 

4. Are the data taken into consideration for the clinical assessment of a real or potential problem more specific for the expert nurse compared to the novice? 

5. Are the decisions made different from the experience of the practitioner? Are the actions defined also different?

Materials and methods

The study design is descriptive, with a quantitative and qualitative approach. A simulated case was used to analyse the decision making capacity of novice and expert nurses, a mode adopted also by Reischmand and Yarandi. The clinical situation was developed by clinical practitioners who worked in the nursing education field and in the scope of clinical surgery. To construct the case we also availed of nursing documentation related to real cases. One of these was a patient subjected to surgery which modified his conditions on the basis of post-operative recovery. The study consisted in three steps; the practitioners were asked to:

a) make a hypothesis of the problem (what do you think is happening?), 

b) make a hypothesis of the possible causes, 

c) make a hypothesis of controls/monitoring that they would perform (what would you check on?), 

d) make a hypothesis of decisions they would make (what would you do?).

In these three cases, we gathered written and observation-al data and questions the practitioner was asked. The concluding action was to examine the assumptions formulated in terms of quantity and quality, the data that hypothetically were needed to verify or discard the assumptions made, the decisions made and the moment in which they were made (before or after the doctor’s intervention). We furthermore needed to see:

e) if the support operator was given supplementary instructions when he/she performs personal hygiene on the patient during the first post-surgery day,
f) what assessments/considerations are done following the request, on the part of the wife/relative of the patient, to resume oral nutrition.

These two sections would be concluded by conducting analyses on whether there are differences between the actions delegated to the support operator and the information furnished between expert and novice nurses regarding the patient (Chart 1).

The group that presented the case was composed of three operators out of which two were nurses working in the nursing educational and clinical surgery fields, and a doctor who also worked in both educational and clinical surgery fields. This group, identified as the project group (PG), furnished the possible assumptions, problems and analyses to be done on the patient along with the decisions deemed as correct to be implemented in the clinical situation proposed. The solutions proposed by the PG became a reference point for the data analysis. To test the comprehension of the questions asked, an expert nurse was chosen.

Setting and participants

The study setting was the surgical department of the General and University Hospital of Udine. The sample for convenience consisted of the nurses working in the surgical department, who gave their consent. For their recruitment were involved the head of the nursing department and Operating Unit coordinators. The coordinators were asked to express an opinion about the nurse relative to clinical experience (novices vs. experts); furthermore, to distinguish between experts and novices, we also referred to the criteria laid forth by Benner:14 the experts were those who had a minimum of three years of experience in the clinical field, exercising at least 30 hours a week, and recognized personally and also by other team practitioners as experts. There were no discrepancies between the assessment of the nurse coordinators and the criteria given by Benner.

Data collection

The data reported by the various nurses involved in the survey were taken into consideration. During data compilation the nurse was always supported by a member of the PG who had a precise guideline to be followed. The questions and observations given by the nurses were then analysed and discussed.
te dagli infermieri sono poi state analizzate e discusse per comprendere se erano indicatori di eventuali ipotesi formulate.

Aspetti etici
Tutti i partecipanti sono stati contattati ed è stato loro spiegato il fine dello studio. È stato richiesto loro il consenso ed è stato garantito l’anonimato relativamente alla propria persona e all’Unità Operativa di appartenenza.

RISULTATI
Il campione
È composto da 16 infermieri di cui il 37.5% (6/16) è novizio ed il 62.5% (10/16) è esperto (Tabella 1).

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Tabella 1 – Caratteristiche del campione in relazione all’appartenenza alla categoria esperto/novizio

<table>
<thead>
<tr>
<th>Unità Operativa</th>
<th>Organizzazione del lavoro</th>
<th>Titolo di studio</th>
</tr>
</thead>
<tbody>
<tr>
<td>UO 1</td>
<td>Turnista</td>
<td>Diploma</td>
</tr>
<tr>
<td>Esperto</td>
<td>6.2% (1/16)</td>
<td>31.2% (5/16)</td>
</tr>
<tr>
<td>Novizio</td>
<td>6.2% (1/16)</td>
<td>31.2% (5/16)</td>
</tr>
<tr>
<td>UO 2</td>
<td>Fuori turno</td>
<td>Laurea</td>
</tr>
<tr>
<td>Esperto</td>
<td>50% (8/16)</td>
<td>31.2% (5/16)</td>
</tr>
<tr>
<td>Novizio</td>
<td>12.5% (2/16)</td>
<td>31.2% (5/16)</td>
</tr>
<tr>
<td>UO 3</td>
<td>Part time</td>
<td></td>
</tr>
<tr>
<td>Esperto</td>
<td>6.2% (1/16)</td>
<td></td>
</tr>
<tr>
<td>Novizio</td>
<td>18.7% (3/16)</td>
<td></td>
</tr>
</tbody>
</table>

L’età media del campione è di 33 anni (23-49; DS 8.5); tra i novizi è di 25 (23-34; DS 4.4), tra gli esperti di 37 (26-49; DS 7.2) (p<0.05). L’esperienza che mediamente il gruppo ha maturato è di 7 anni (0-20; DS 6.4); tra i novizi è di 11 mesi (3-40; DS 14.3) e tra gli esperti di 11 anni (5-20; DS 5.4) (p<0.05). Il 50% (8/16) degli infermieri ha avuto precedenti esperienze cliniche: il 18.7% (3/16) tra i novizi con una esperienza media di 8 mesi (1-23) ed il 31.2% (5/16) tra gli esperti con una media di 17 mesi (5 mesi-10 anni).

I problemi
Nella situazione clinica n. 1 (richiedeva l’individuazione dei possibili problemi dell’utente all’uscita della sala operatoria), le problematiche individuate mediamente da ogni
to verify whether these were indications of possible formulation of assumptions.

Ethical aspects
All the participants were contacted and informed of the aim of the study. Their consent was asked and anonymity guaranteed regarding their identities and the Operating Unit they belonged to.

RESULTS
The sample
A total of 16 nurses out of which 37.5% (6/16) were novices and 62.5% (10/16) were experts (Table 1).

Table 1 – Characteristics of the sample in relation to expert/novice categories

<table>
<thead>
<tr>
<th>Operating Unit</th>
<th>Work organization</th>
<th>Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>UO 1</td>
<td>Shifts</td>
<td>Diploma</td>
</tr>
<tr>
<td>Expert</td>
<td>6.2% (1/16)</td>
<td>31.2% (5/16)</td>
</tr>
<tr>
<td>Novice</td>
<td>12.5% (2/16)</td>
<td>31.2% (5/16)</td>
</tr>
<tr>
<td>UO 2</td>
<td>No shifts</td>
<td>Degree</td>
</tr>
<tr>
<td>Expert</td>
<td>50% (8/16)</td>
<td>31.2% (5/16)</td>
</tr>
<tr>
<td>Novice</td>
<td>18.7% (3/16)</td>
<td>31.2% (5/16)</td>
</tr>
<tr>
<td>UO 3</td>
<td>Part time</td>
<td></td>
</tr>
<tr>
<td>Expert</td>
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<tr>
<td>Novice</td>
<td>18.7% (3/16)</td>
<td></td>
</tr>
</tbody>
</table>

The average age of the sample was 33 years (23-49; DS 8.5); among the novices it was 25 (23-34; DS 4.4), among the experts, 37 (26-49; DS 7.2) (p<0.05). The work experience of the group achieved was an average of 7 years (0-20; DS 6.4); among the novices it was 11 months (3-40; DS 14.3) and among the experts it was 11 years (5-20; DS 5.4) (p<0.05). 50% (8/16) of the nurses had previous clinical experience: 18.7% (3/16) of the novices with an average experience of 8 months (1-23 months) and 31.2% (5/16) of the experts with an average of about 17 months (5 months-10 years).

The problems
In clinical situation n. 1 (which required the identification of the patient’s probable problem upon leaving the operating theater),
Nella situazione clinica n. 2 (presentava il paziente in stanza uscito da poco tempo dalla sala operatoria con una SpO2 dell’88%) mediamente gli infermieri esperti hanno individuato 3.3 problemi (2-4) e i novizi 3.1 (1-4). Prevale tra gli esperti il problema “possibile inattendibilità del dato” individuato dall’80% (8/10) degli infermieri esperti e dal 66.7% (4/6) dei novizi. Tra i novizi prevale il problema “ipossiemia” individuato nel 100% dei novizi (come primo possibile problema) e nel 60% (6/10) dagli esperti come possibile problema, ma solo successivamente all’esclusione dell’inattendibilità del dato. Gli infermieri esperti considerano come problema importante il dolore [50% (5/10) vs. 16.7% (1/6)] e la scorretta posizione del paziente che non riesce a ben ventilare [50% (5/10) vs. 33.4% (2/6)].

La possibile inferenza sul valore della saturazione come possibile valore basale in quanto broncopneumopatico (SpO2=8%) è stata fatta dagli esperti nel 50% (5/10) dei casi e nel 16.7% (1/6) dai novizi.

Nella situazione clinica n. 4 il paziente si presentava pallido e sudato. Emergono 13 diverse ipotesi di problema: 5 tra gli infermieri esperti e 8 tra i novizi. In comune tra i due gruppi vi sono il problema dell’emorragia, dell’ipoglicemia, del dolore, il problema respiratorio e il problema cardiaco. In aggiunta i novizi individuano nausea e vomito, ileo paralitico, perazione intestinale. Mediamente vengono individuati 3.4 (2-5) problemi tra gli esperti e 5.0 (3-8) tra i novizi. Prevalgono tra gli esperti l’emorragia [100% (10/10)] e l’ipoglicemia [100% (10/10)] che tra i novizi registrano una frequenza del 100% (6/6) per l’emorragia e del 66.7% (4/6) per l’ipoglicemia.

Il monitoraggio

Nella situazione clinica n. 1 è stata effettuata l’analisi sui dati che vengono proposti per il monitoraggio di un’eventuale emorragia e del problema cardiaco.Rispetto all’emorragia, i dati identificati come un possibile problema, ma solo after excluding the unreliability of the data. The expert nurses considered pain as an important problem [50% (5/10) vs. 16.7% (1/6)] and the incorrect position of the patient who could not be properly ventilated [50% (5/10) vs. 33.4% (2/6)].

The possible inference on the value of saturation as a possible basic value due to bronchopneumonia (SpO2=8%) was registered by the experts in 50% (5/10) of the cases and in 16.7% (1/6) by the novices.

In clinical situation n. 4 the patient appeared pale and sweating. Thirteen hypotheses emerged with regard to the problem: five were given by the expert nurses and eight by the novices. The two groups had in common the problems of hemorrhage, hypoglycemia, pain, respiratory and heart problems. In addition, the novices identified nausea and vomiting, paralyzed ileum, and intestinal perforation. An average of 3.4 (2-5) problems were identified among the experts and 5.0 (3-8) among the novices. What prevailed among the experts were hemorrhage [100% (10/10)] and hypoglycemia [100% (10/10)] which among the novices registered a frequency of 100% (6/6) for hemorrhage and 66.7% (4/6) for hypoglycemia.

Monitoring system

In clinical situation n. 1 an analysis was done on the data that was proposed for the monitoring of possible hemorrhage.
ti espressi sono in media 1.5 (1-5), tra cui pressione arteriosa e frequenza cardiaca, drenaggi e medicazioni; la quantità dei dati è la medesima sia per gli infermieri esperti sia per i novizi (100%). L’assetto emocoagulativo (INR), invece, è stato preso in considerazione dal 50.5% degli esperti (5/9) e dal 16.6% dei novizi (1/6). Per il monitoraggio di un possibile problema cardiaco, gli infermieri esperti evidenziano la frequenza cardiaca [100% (2/2)] mentre i novizi aggiungono la pressione arteriosa e la frequenza cardiaca nel 100% (1/1) dei casi.

Nella situazione clinica n. 2 sono stati analizzati i dati che potrebbero essere monitorati per verificare una possibile inattendibilità del dato del saturimetro e il problema dell’ipoossiemia. Gli esperti individuano mediamente 1.6 (1-2) dati: arto freddo [100% (8/8)] e maschera di ossigeno non correttamente posizionata [62.5% (5/8)]. Tra i novizi i dati sono mediamente 2.7 (2-3): pressione arteriosa e frequenza cardiaca [75% (3/4)], terapia prescritta dall’anestesista [75% (3/4)], colorito cutaneo [75% (3/4)] e frequenza respiratoria [100% (4/4)]. Analizzando il problema “ipossiemia” emerge che tra gli esperti i dati di monitoraggio sono mediamente 1.0 (1-2): disipnea soggettiva del paziente [100% (6/6)] e frequenza respiratoria [50% (3/6)]. Tra i novizi i dati di monitoraggio sono mediamente 1.7 (1-5): pressione arteriosa e frequenza cardiaca [83.3% (5/6)], controllo della terapia prescritta dall’anestesista [66.7% (4/6)], stato di coscienza [50% (3/6)], disipnea [50% (3/6)], frequenza respiratoria [50% (3/6)], temperatura corporea [50% (3/6)] e colorito cutaneo [16.7% (1/6)].

Nella situazione clinica n. 4 ci si è soffermati sui dati di monitoraggio relativi all’ipoglicemia.

Gli esperti individuano mediamente 1.5 controlli/parametri (1-2) tra cui nel 100% (10/10) la valutazione del glucostick e nel 50% (5/10) la valutazione della coscienza. I novizi mediamente individuano 4.5 (3-5) controlli/monitoraggi: nel 100% (6/6) la valutazione del glucostick, nel 100% (6/6) la valutazione della pressione arteriosa e della frequenza cardiaca, nel 100% (6/6) la valutazione della saturazione, nel 66.7% (4/6) la valutazione della coscienza e della diuresi.

Gli interventi/le decisioni

Agli infermieri esperti e novizi, infine, è stato chiesto, nelle diverse situazioni cliniche, in base ai problemi ipotizzati e ai

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rhage and heart problems. With respect to hemorrhage, the data given were at an average of 1.5 (1-5), among which were arterial pressure and heart rate, and drainage and medications; the quantity of data was the same for both expert and novice nurses (100%). The hemocoagulation condition (INR), instead, was taken into consideration by 50.5% of the experts (5/9) and 16.6% of the novices (1/6). For the monitoring of a possible heart problem, the expert nurses measured heart rates [100% (2/2)] while the novices added arterial pressure and heart rates in 100% (1/1) of the cases.

In clinical situation n.2 the data that could be monitored were analysed to verify a possible reliability of the saturimeter data and the hypoxemia problem. The experts identified an average of 1.6 (1-2) data: cold legs [100% (8/8)] and oxygen mask not correctly positioned [62.5% (5/8)]. Among the novices the data were at an average of 2.7 (2-3): arterial pressure and heart rate [75% (3/4)], therapy prescribed by the anesthetist [75% (3/4)], skin color [75% (3/4)] and respiratory rate [100% (4/4)]. In analyzing the “hypoxemia” it appeared that among the experts the monitoring data were at a mean of 1.0 (1-2): subjective dyspnea of the patient [100% (6/6)] and breathing rates [50% (3/6)]. Among the novices the monitoring data were at a mean of 1.7 (1-5): arterial pressure and heart rate [83.3% (5/6)], control of the therapy prescribed by the anesthetist [66.7% (4/6)], state of consciousness [50% (3/6)], dyspnea [50% (3/6)], breathing rate [50% (3/6)], body temperature [50% (3/6)] and color of the skin [16.7% (1/6)].

In clinical situation n. 4 we reflected on the monitoring data related to hypoglycemia.

The experts identified a mean of 1.5 controls/parameters (1-2) among which in 100% (10/10) was the assessment of the glucostick and in 50% (5/10) the assessment of consciousness. The novices identified a mean of 4.5 (3-5) controls/monitoring: 100% (6/6) the assessment of the glucostick, in 100% (6/6) the assessment of arterial pressure and heart rate, in 100% (6/6) the assessment of saturation, in 66.7% (4/6) the assessment of consciousness and diuresis.

The action plan/decisions

The expert and novice nurses were furthermore asked, in the various clinical situations, what interventions they would
have undertaken to handle the situation on the basis of hypothetical problems and data that they would have gathered.

In clinical situation n. 2 we analysed the decision to “call the doctor” which was made in 100% of the cases by both novices and experts. Among the experts the decision was made in 100% of the cases after the problem had been verified (“[...] with a SpO2 of 88% I would call the doctor only after having excluded hypothermia, the malfunctioning of the saturaometer, the wrong positioning, pain and the baseline data”). This pathway was suggested in 50% (3/6) of the cases: 3 novice nurses checked the data and decided to “call the doctor”, whereas in the rest of the novice group (50%) the decision to call the doctor was made immediately and patient assessments were carried out in the meantime.

In clinical situation n. 3, the patient was in the first post-surgery day, and the nurse needed to instruct the support operators who performed hygiene services on the patient. Two aspects came to light. The first was that the patient was not to be mobilized, and no instructions were given to the support operator before the nurse had carried out a personal assessment: 66.7% (4/6) among the novices vs. 50% (5/19) of experts. The second aspect concerned the decision to mobilize the patient without first having personally assessed the patient, which occurred in 50% (5/10) of the expert nurses vs. 33.3% (2/6) of the novices and the assigning to the support operator the task of performing breathing exercises through the incentive spirometer which occurred only in 30% (3/10) of the nurses.

On analyzing clinical situation n. 4, we decided to take into consideration the decision to “administer glucose” in relation to the problem of hypoglycemia. This decision was made in 100% (10/10) of cases by experts and novices [100% (4/4)]. The novice made an additional decision which was to take into consideration serial sticks [25% (1/4)]. Among the experts, 30% (3/10) would have then called the doctor but would have continued to observe the patient. Among the novices, instead, 100% (4/4) would have called the doctor after the glucostick.

In clinical situation n. 5 the nurse was asked which assessment and decision he/she would have considered in response to the patient’s wife who asked whether her husband could have something to eat, on the third post-surgery day.
Emerging 3 valutazioni nel totale del gruppo:
1. verifico la presenza del Sondino Naso Gastrico (SNG),
2. della canalizzazione,
3. di eventuale nausea e vomito.

Le decisioni sono:
1. guardo la prescrizione della dieta fatta dal medico,
2. inizio a far bere il paziente.

Il 70% (7/10) degli infermieri esperti consulta la dieta prescritta dal medico solo in seguito a valutazioni che sono per il 60% (6/10) la verifica della presenza del SNG, per il 100% (10/10) la ripresa della canalizzazione e per il 10% (1/10), la presenza di nausea e vomito; nel 30% (3/10) dei casi, gli infermieri esperti decidono di dar da bere al paziente direttamente in seguito alla verifica dell’avenuta canalizzazione.

Tra i novizi l’83.3% (5/6) valuta la prescrizione della dieta del medico; solo successivamente, il 66.7% (4/6) valuta l’avenuta la canalizzazione, il 33.3% (2/6) la presenza di nausea e vomito e il 16.7% (1/6) la presenza del SNG. Nessuno tra gli infermieri novizi prende direttamente la decisione di dare da bere al paziente.

Discussione
La presa di decisioni è l’ultima fase di un processo che prevede la comprensione del problema, l’analisi dei possibili risultati ottenibili sul paziente e quindi l’attuazione dell’intervento che viene ritenuto più idoneo. Nel nostro studio gli infermieri esperti individuano mediamente meno problemi dei novizi ma più pertinenti rispetto alla situazione clinica di base del paziente simulato. Nella situazione clinica n. 1, gli infermieri esperti monitorizzano il paziente nell’immediato post operatorio perché potrebbe verificarsi una emorragia, un problema respiratorio o cardiaco poiché il paziente è in terapia anticoagulante ed ha una patologia cronica respiratoria e cardiaca. I novizi invece spaziano su un numero maggiore di problemi (ritenzione urinaria, infezione del sito chirurgico e sovraccarico idrico), tutti meno prioritari rispetto a quelli individuati dall’esperto e non pertinenti per un paziente appena dimesso dalla sala operatoria. Nell’immediato postoperatorio difficilmente è individuabile un’infezione, la ritenzione urinaria non è pertinente perché il paziente è portatore di catetere vesical e, in questa fase, ci si aspetta piuttosto una carenza del volu-

The entire group made 3 assessments to:
1. verify the presence of the Naso Gastric Tube (NGT),
2. verify digestive channel conditions,
3. possible nausea and vomiting.

The decisions were:
1. consult the diet prescribed by doctor,
2. start making the patient drink.

70% (7/10) of the expert nurses would have consulted the diet prescribed by the doctor only after the following assessments: 60% (6/10) the presence of an NGT; 100% (10/10) the recovery of the digestive channels, 10% (1/10) the presence of nausea and vomiting. For 30% (3/10) of the cases, the expert nurses gave the patient directly to drink after verifying the recovery of the digestive channels and that there were no NGTs. Among the novices, 83.3% (5/6) would have first assessed the doctor’s diet prescriptions and 66.7% (4/6) would have assessed the digestive channels. For 33.3% (2/6) the presence of nausea and vomiting and 16.7% (1/6) the presence of NGTs. None among the novices directly made the decision to make the patient drink.

Discussion
Decision making is the last phase of a process which entails the comprehension of the problem, the analysis of the possible results obtainable from the patient and thus the implementation of the actions deemed to be the most suitable. In our study the expert nurses compared to the novices on the average identified less problems but these were more pertinent to the clinical baseline situation of the simulated patient. In clinical situation 1 the expert nurses monitored the patient in the early post-surgical stage since there could be phenomena of hemorrhage, or breathing and heart problems. The novices instead covered a greater number of problems (urinary retention, infection of the surgical site, and water retention), aspects with less priority compared to those identified by the experts and not relevant to a patient who has just returned from the operating room. In the immediacy of operations infections are improbable, and urinary retention is not pertinent since the patient has a bladder catheter and in this phase one would most expect a lack of volume
of liquids rather than an overload of liquids, that may arise at a later time. In clinical situation n. 4 the same difference occurred between experts and novices. The pale and sweating patient led the expert to make few and specific assumptions (hypoglycemic crisis and/or hemorrhage) whereas the novices were apt to consider many other problems such as ileum paralysis, nausea and vomiting or a possible intestinal perforation, which are all less plausible problems in the patient in this case, and who is also diabetic, even though nausea and vomiting could surely be determined by a disorder, but this assumption was not even taken. The expert nurses were more precise in comprehending the problem, making less assumptions and gathering essential data to confirm or discard the assumptions, whereas the novices found it more difficult since they had a lot of information and were not able to focus on specific problems. It disproves, however, all that was affirmed instead by both White et al.25 (25) and Hoffman et al.22 who said that the expert nurses are those who gather a wider range of information. However literature here is scarce and the results of this pilot study cannot certainly be generalized.

In clinical situation n. 2 the data related to oxygen saturation did not immediately worry the experts, who immediately verified the reliability of the data whereas the novice immediately thought of a breathing problem. Also in this case, the experts made extremely pertinent hypotheses such as measuring of oxygen saturation on a cold limb, or a poor adherence to the oxygen mask, or a value most probably close to the baseline value of the patient, while the novices directly associated this value to a respiratory problem, as per theoretical knowledge. Once again we have a confirmation of Benne’s16 affirmation compared to the extreme trust the novices place in the rules and theoretical principles.

Within the scope of decisions to undertake a possible oxygen desaturation, there was a substantial difference. The experts reacted in a proactive manner because, after having generated the hypotheses (cold limb, baseline value and mal-positioning of oxygen mask), they requested the intervention of the doctor, while the novices, extremely worried and uncertain of how to interpret the ongoing situation, would have first called the doctor and then focused on the
patient to measure the parameters. With respect to the time frames in which the novice would call for the doctor’s intervention, the conclusions of our study clash with what was affirmed by Bucknall. According to this author the novice first tends to have a clear idea of what is happening to the patient, and, only later, would request the doctor’s intervention. We have to consider that our study was performed in a simulated situation which could have induced the nurses to react in a different way from what they would really have done in the field. In relation to monitoring of the possible breathing problem, the experts referred to few but specific data, while the novices indicated a lot of data, some of which were not pertinent. This is in line with the affirmations of Hoffman.

The administration of glucose as an intervention to resolve hypoglycemia was made mostly by the experts who would have continued to monitor the patient without necessarily requesting the doctor’s intervention, unlike the novice nurses. Also with respect to the decision to restart nutrition, it was confirmed that the expert first interprets the situation and then consults the doctor regarding the decision to allow the patient to drink, while the novice would immediately ask the doctor to make the decision.

Within the scope of instructions to be given to nursing aids, with regard to mobilization on the first post-surgical day, 67% of the novices affirmed that they would first assess the patient personally and would never assign the respiratory exercises. Among the expert nurses instead, there was a more frequent attribution to both mobilization and breathing exercises. Most probably, the expert nurses, due to their clinical experience gathered over the years, are “more convinced” in their actions. We cannot say, however, if later they would have gone to the patient to verify if the respiratory exercises were being done in the right way.

Even in our study, the expert nurses were more precise in comprehending the problem. They made less assumptions and gathered essential data to confirm and discard the hypotheses made, whereas the novices found it difficult since they had a lot of information and were unable to focus on them. Our conclusion confirms those of some authors but instead disproves what both White et al.
et al.\textsuperscript{25} said Hoffman et al.\textsuperscript{22} about the expert nurses gathering more information even if they have a fast and more effective process of problem comprehension and decision making. Compared to the clinical reasoning abilities of novices, it is seen that these act before completely comprehending the patient’s problem, and, in fact, they call the doctor so he can assess the patient and in the meantime gather information to see what is happening. We have to stress, however, that the results of this pilot study certainly cannot be generalized.

**Conclusions**

In this pilot study highlights the fact that within the surgical scope the expert nurses are fast and effective in the decision making process compared to the novices. The results cannot, however, be generalized firstly because only a small nurse sample was taken and from a sole hospital with practices and customs that may have influenced the answers given. We furthermore are not sure that the actions proffered by the practitioners in a simulated situation would be the same as those in a real situation. It would be worthwhile to test and validate these conclusions “on-site.” It would furthermore be useful to involve a wider sample of nurses from different hospitals, since, as Aiken et al.\textsuperscript{26} and Thompson\textsuperscript{13} said, the environment, intra-professional relationships and organizational models could influence the decisions practitioners make.

Our heartfelt thanks to RNs Grazia Bevilacqua, Sara Bressan, Rosa Buttacavoli, Arianna Calcagno, Leonardo Ditaranto, Donatella Giavazza, Simonetta Grubissa, Aurelia Paparoni, Silvia Pauletto, Camilla Quaini, Cristian Roiatti, Irene Salvatore, Daniela Specogna, Iulia Georgiana Trusca, Regina Vuanello, of the Surgical Dept. Of the General University Hospital of Udine, for taking part in this study.
Bibliography

Caso clinico

Il signor M. R. di 75 anni entra in chirurgia per sottoporsi a un intervento di colectomia per carcinoma del colon. Dall’anamnesi risulta che è affetto da BPCO, da scompenso cardiaco, da diabete mellito insulinodipendente. È inoltre affetto da fibrillazione atriale in TAO che è stata sospesa circa 10 giorni fa. Oggi il suo INR è di 1.8.


Cosa controlli nelle prossime ore? Per monitorare quali possibili problemi? Puoi fare delle ipotesi sulla causa dei problemi?

INDICALI SECONDO UN ORDINE DI PRIORITÀ

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<th>Problemi</th>
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Il paziente è appena uscito dalla sala operatoria. Il tuo collega, che è appena uscito dalla stanza, lo ha monitorato e sistemato in una stanza dove ha provveduto ad impostare la terapia prescritta dall’anestesista. Entri per prendere un palo di flebocilisi e noti che il paziente presenta una SpO2 dell’88%.

Che valutazioni fai? Che interventi metti in atto?

Sono le ore 7.00. Il paziente è in prima giornata postoperatoria. Gli operatori di supporto stanno andando a fare l’igiene al paziente. Dai qualche indicazione? Quale?

Sono le ore 8.00. Il paziente è in prima giornata post operatoria. Entri in stanza e noti che è pallido e sudato.

Che valutazioni fai? Che interventi metti in atto?

Il paziente è in terza giornata postoperatoria. La moglie ti chiede se a pranzo potrà mangiare qualche cosa.

Che valutazioni fai prima di rispondere? Che cosa dici alla moglie?