AN INVESTIGATION INTO, AND AN INTERVENTION DESIGNED FOR, DIFFICULTIES THIRD LEVEL NURSING STUDENTS HAVE WHEN MAKING CLINICAL JUDGEMENTS

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A Mini-thesis submitted in partial fulfilment of

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DECLARATION

I declare that **AN INVESTIGATION INTO, AND AN INTERVENTION DESIGNED FOR, DIFFICULTIES THIRD LEVEL NURSING STUDENTS HAVE WHEN MAKING CLINICAL JUDGEMENTS** is my own work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

NAME : June Deanna Jeggels DATE : June 1995

SIGNED : 

ABSTRACT.

An Investigation into, and Intervention designed for, difficulties third level nursing students have when making clinical judgements.

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In order to establish the specific difficulties experienced by students, the researcher tested their clinical judgement skills on a fixed task.

Interviews were conducted using simulated clinical scenarios as problem statements and additional information was provided in the form of patient records.

Protocol analysis was done by using Feuerstein's cognitive map as a frame of reference. (Feuerstein, 1980) The results indicated that students displayed some cognitive operations but that there was little evidence of structured thought.

In order to streamline the students' approach and provide some measure of control, they were exposed to a "thinking procedure" that resembled Landa's problem solving heuristic. (Landa, 1976) They were allowed to internalize the heuristic procedure through practise, using the peer-pair think-aloud method described by Whimbey and Lockhead (1982).

Once again individual interviews were conducted to evaluate the effectiveness of the intervention.

Perkins & Salomon (1989) stressed the importance of this type of evaluation in measuring the value of teaching a domain specific heuristic.

The results of the study showed an improvement in the students' approach and management of clinical problems. The peer-pair sessions facilitated group interaction. Students also displayed a transferral of the judgement skills to real life situations. These findings were reflected by the positive response of participants to an evaluative questionnaire.

KEY WORDS / PHRASES.

Cognitive science

Clinical judgement

Nursing education

Heuristics

Peer-pair problem solving

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Ms. R. Jansen who unselfishly typed and retyped the manuscript.
Ms. L. Britten who did the final editing, and
My brothers for their support.

DEDICATION.

This Minithesis is dedicated to the memory of my parents Manie and Anne Jeggels, the significant adults who, unwittingly, introduced me to mediated learning during my formative years.

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CHAPTER 1.

GENERAL INTRODUCTION

1.1 INTRODUCTION

" Many people in general and disadvantaged people in particular, learn with difficulty and many times not at all." (Mehl, 1989: 10)

This research was prompted by the concern about the poor judgement skills displayed by nurses in the clinical field.
The researcher was often puzzled by the response of student nurses to the question " What is this patient's problem? "
These ranged from " He has TB " to " I do not know the patient."

The patient's records would not be consulted, neither would a cursory assessment of his condition be made. However, when students were questioned about different aspects of the patient's condition and nursing care, they would often provide the correct information.
Similar encounters were frequently related by staff members involved with student accompaniment.

A perception developed that nurses experience difficulty with structured thought.
Little existed in local nursing research literature to indicate whether this phenomenon was the exception or the rule. The question that arose was whether thinking and problem solving skills could be taught.

In South Africa the problem of teaching and learning has been exacerbated by an educational system driven by apartheid legislation. The department of education was until recently fragmented with an unequal spread of both human and material resources.

This was compounded by the fact that subjects for matriculation were frequently chosen for the ease with which they could be learned by rote. (Abel, 1993) Rote learning require learners to memorize large chunks of material without stimulating them to analyze or explore the content. This produced individuals who found that once they have passed their matriculation examinations, they have neither the thinking skills nor the subjects needed to find jobs. (Rautenbach, 1992)

How then, do we address the backlog that learners bring to the tertiary learning institution ?

Mehl (1985), Wesso (1992), and Abel (1993) looked to employing the cognitive operations approach to the teaching of thinking in order to gain an understanding of the processes which underlie the acquisition and utilization of knowledge. They then proceeded to develop content-dependent intervention mechanisms to address the cognitive difficulties displayed by the learners.

The controversy that has developed around whether cognitive skills are context bound or not, is reflected in the variety of approaches to the teaching of thinking. (Perkins & Salomon, 1989)

1.2 APPROACHES TO THE TEACHING OF THINKING

Domain-independent approaches.

Programs for teaching thinking by utilizing domain-independent approaches ie. providing learners with general thinking skills, include : the Instrumental Enrichment program (Feuerstein, Rand, Hoffman & Miller, 1980); the C.O.R.T. Thinking program (de Bono, 1985) and Intelligence Applied (Sternberg, 1986).

A review of these and other interventions may be found in Nickerson, Perkins and Smith (1985).

Perkins and Salomon (1989: 18) make a case against domain-independent approaches by listing contrary findings under : the arguments from expertise, the arguments from weak methods and the arguments from transfer. However, after a critical examination of the cited arguments, they conclude that general strategies still have a place in the teaching of thinking.

Domain-specific approaches.

In this case the thinking or problem solving skills are identified, and then taught by imposing them on the subject content.

Programs that highlight this approach include :

Concept mapping (Novak & Gowin, 1984) where learners are presented with a tool that may be used to organize large amounts of information.

In the case of peer-pair problem solving (Whimbey & Lockhead, 1982) learners are exposed to the thoughts of expert problemsolvers.

Knowledge as design (Perkins, 1986) involves a structured approach to thinking, where learners have to answer four probing questions about subject content.

About the approach of choice, Perkins and Salomon (1989: 24) conclude that,

> the approach that now seems warranted, calls for an intimate intermingling of generality and content specificy in instruction ... and that such an approach gets beyond educating memories to educating minds.

Nickerson, et al., (1985) highlight different approaches to the teaching of thinking, amongst others ; the cognitive operations approaches, heuristic oriented approaches and formal thinking approaches. They argue that the heuristic oriented approach could positively influence the individual's problem solving abilities. This however, is based on the assumption that the learner already possesses a knowledge base as well as basic cognitive skills.

It should also be noted that the heuristic oriented approach may be applied in domain-independent (de Bono, 1985), as well as domain-specific areas. (Whimbey & Lockhead, 1982)

The researcher looks to marrying two approaches in order to identify (cognitive operations) and address (heuristics) the difficulties students have when making clinical judgements.

1.3 THE TEACHING OF THINKING

The teaching of thinking is a relatively new concept. As recently as the late 70's Feuerstein (1980) developed a thinking skills program.

Nickerson, et al., (1985) expressed the need for a greater educational emphasis on the teaching of thinking. They emphasize the interdependency of thinking skills and knowledge and the fact that neither can be developed independent of each other.

Mehl (1985) states that although research literature considered the mental operations involved in problem solving in some detail, very little has been said about the way in which disadvantaged students approach problems in various content areas. He also provides an overview of why he considers students selected to the University of The Western Cape to be disadvantaged and why Feuerstein's methods could be employed to research the difficulties displayed by these students.

1.4 THE AIM OF THE STUDY

The aim of this particular study is to design an intervention to address some of the difficulties student nurses have with the making of clinical judgements.

Since most of the students included in this program are from a disadvantaged background, this study will focus firstly on identifying the difficulties displayed by students when making clinical judgements and secondly on addressing these difficulties through intervention.

The intervention is aimed at facilitating the application of a problem-solving heuristic in a domain specific area. Implicit in the exercise is the opportunity for students to interact with their peers. They are also given the chance to make judgements in a non-threatening simulated environment.

CHAPTER 2.

REVIEW OF RESEARCH LITERATURE

2.1 INTRODUCTION

In a survey on research priorities in the field of Nursing Education in the United States of America, the teaching of problem-solving strategies was identified as the second highest priority topic of a list of sixty three (Tanner & Lindeman, 1987). However, local research on the topic is limited to studies in the related fields of psychology, science and mathematics.

Loving (1993: 415) defines clinical judgement as " ...the ability to make inferences from data gathered during the problem solving process." He also states that the term clinical judgement is frequently used interchangeably with clinical decision making. The latter statement is underscored by Tschikota's (1993: 389) view that clinical decision making refers to "... the selection of nursing interventions, and include the thoughts that precede choice."

It becomes clear that clinical judgement represents a complex process which entails the ability to make inferences (select interventions) from data collected during the problem-solving process. Students are expected to apply sound theoretical reasoning when extracting and interpreting data presented in various modalities ie. graphs depicting changes in the patients' vital signs, charts indicating their daily fluid balance and records reflecting the prescribed treatment.

Since it has been the researcher's experience that nursing students have difficulty when making clinical judgements, an attempt should be made to address these difficulties.

Klayman and Brown (1993: 98) state that "...human judgement may be well adapted but it is not always very adaptable."
They profess that errors in judgement "...can be viewed as indicative of mismatches between the cognitive processes people use and the tasks to which these processes are applied." (1993: 98)
"Tasks" in this study refer to clinical judgement skills.

Klayman and Brown (1993) suggest that one should try to modify the cognitive processes to fit the task by employing different strategies, amongst others, providing people with better cognitive tools, and training people in task specific processes, ie. domain specific heuristics.
This suggestion reiterates Perkins & Salomon's (1989: 23) earlier view that "...more experiments in teaching heuristics are needed that test whether gains in problem solving can be attributed directly to the use of heuristics." Furthermore, Perkins & Salomon (1989) state that the lack of problem-solving strategies (and the gains from applying heuristic rules) should be documented before and after such interventions.

Shayer and Adey, (1981) also stressed the need for matching material to learners. In their search for a model they argued that a model should be able to address both the learning material and the learner's thinking processes.

Even though they did not profess the cognitive domain to be the only variable, they restricted their research to cognitive matching. They grounded their model in the Piagetian developmental stage theory. The strategies suggested by them to improve the match were, to find an appropriate topic for the learner and/or to take the learner's developmental stage into account. (Shayer & Adey, 1981)

Because clinical nursing judgement is regarded to be cognitive in nature, the theoretical framework for this study is grounded in the cognitive sciences. (Loving, 1993: 415)

2.2 THEORETICAL OVERVIEW.

An overview of the relevant theories follows. The researcher will apply amongst others, Feuerstein's concept of cognitive modifiability and cognitive map, the information-processing approach of cognitive psychology and the heuristic approach to the solving of problems. In order to locate this research in theory, it is necessary to reflect on different paradigms of the century, amongst others: Behaviourism, Gestalt psychology, Constructivism and Cognitive science.

BEHAVIOURSIM

The behaviourists focused mainly on the so-called "connections" between stimuli and response (S - R). Stimuli followed by positive response become reinforced and connections become stronger through exercise. This framework formed the basis of "drill and practice" instructional programs. (Knoers, 1994)

GESTALT PSYCHOLOGY

Early Gestalt psychology was based on the principle that a figure " Gestalt " can only be seen because it is etched against a background. Learning meant "... getting insight, discovering a structure." (Knoers, 1994: 2880).

However, the Gestaltists did contribute toward the development of problem-solving strategies by suggesting that an alternative approach should be sought if the first one did not lead to a solution.

CONSTRUCTIVISM

Constructivists were of the opinion that all learners build (construct) their own knowledge. Teaching should therefore not be construed as putting knowledge into learners' heads but rather as creating an opportunity for them to construct their own knowledge. However, in order to construct new knowledge, the learner relies heavily on what he already knows. (Resnick & Collins, 1994) This view is shared by cognitive researchers even though their theoretical framework vary.

CONSTRUCTIVIST THEORISTS

PIAGET AND VYGOTSKY

According to Kozulin (1994: 269) "the cognitive and sociocultural revolution in learning" was brought about by Jean Piaget of Switzerland and Lev Vygotsky of Russia.

He reviewed the commonalities and differences between the theories of these great psychologists.

Both share the view that a child cannot be regarded as a miniature adult displaying adult behaviour on a small scale.

They agree, to some extent, on the relationship between action and thought. However, Vygotsky takes the notion of interaction between the child and an object a step further. He argues that such an interaction forms part of a broader socio-cultural activity.

Piaget proposed that intellectual development proceeds through different stages and that every stage is characterized by particular patterns of thought. Furthermore, he believed that children's learning and development is a function of their own activity. Vygotsky (In Kozulin, 1994: 272) was of the opinion that "...mental development does not coincide with the development of separate psychological functions, but rather depends on changing relationships between them."

Their differences lie in their attitude towards learning. Piaget sees learning as the unassisted interaction between a child and his external world. Alternatively, Vygotsky places a significant adult, one who guides and transmits a culture, between the child and his world. With the concept of "zone of proximal development" (ZPD) he suggests that cognitive modifiability is possible under adult guidance or in collaboration with more capable peers.

"The ideas of discovery learning developed by Piaget, and that of guidance in learning developed by Vygotsky are of great importance to education" (Knoers, 1994: 2881)

COGNITIVE SCIENCE

Cognitive Science represents a complex and abstract field of study because thought processes are hidden from external observation and are often unconscious. (Landa, 1976)

The **cognitive psychology** approach focuses on the underlying cognitive processes that govern human behaviour. These processes are analyzed in order to explain behaviour.

> The analysis considers the human being as an information processing system, and focuses on the cognitive processes, the cognitive structures, and strategies employed. (Knoers, 1994, 2882)

The **information processing** approach focuses on how the processing actually occurs. Within the framework of this model, it is assumed that information is stored in several memories having different capacities and accessing characteristics. Recently acquired information is kept in the processor's short-term memory (STM), and is directly accessible for processing. Information is stored in the individual's long-term memory (LTM) in the form of "chunks" - the latter will depend upon the individual's knowledge base and past experience. The learner's processing capacity is limited by the structure of and the relationship between the (STM) and (LTM). However, active processing takes place in the (STM). (Ericsson & Simon, 1984)

A belief exists that when a learner performs a problem-solving task the verbalization, occurring concurrently with the task, reveal the pattern of information that is attended to without altering the cognitive processes of the learner. (Ericsson & Simon, 1984).

The **heuristic** approach focuses on the strategies employed to facilitate the process of thinking and problem solving.

Whimbey and Lockhead state that "the ability to analyze material and solve problems, is a skill", and they suggest that learners be exposed to the sequences of thought of expert problem solvers. (1982: 21)

To structure and control their cognitive operations the researcher provided the learners with a "thinking procedure" with which to approach the problem solving exercise. The thinking procedure resembles Landa's problem-solving heuristic. (See Chapter 4)

Streamlining the approach to the problems, enables one to address some of the cognitive difficulties displayed by the learners.

COGNITIVE THEORISTS

FEUERSTEIN'S THEORY

Feuerstein, an Isreali clinical psychologist, holds the view that intelligence is a dynamic process that may be influenced through intervention. However, in order to effect such a change, the subject should be open to external influence ie. be modifiable.

Cognitive modifiability

The concept of structural cognitive modifiability is based on the assumption that human organisms are open systems and have the unique capacity of becoming cognitivly modified. However, some do present with a reduced level of modifiability and this factor may be attributed to cultural deprivation.

The latter means that some children have been deprived of their own culture. (Feuerstein, et al., 1980) This occurs when a child is relocated at an early stage and is not exposed to the unique socialization processes of his/her own culture.

Mehl (1991) states that it is particularly true of the Southern African society where amongst others, the migrant labour system has caused a total breakdown in normal family life. Cultural transmission is perceived by young people as representing a perpetuation of inequality. These individuals may function well in normal day to day living, but as soon as they are confronted by new information they display reduced modifiability. However, it is important to distinguish between cultural deprivation, and cultural difference.

Individuals from the culturally different sub-groups often excel in their levels of cognitive functioning despite being different to the dominant culture. (Mehl, 1991)

Feuerstein bases the concept of cognitive modifiability on the theory of mediated learning experience.

Mediated learning experience

This theory contrasts with that of the Piagetian stimulus - organism - response approach in that it places a mediator between the stimulus and the organism. However, Vygotsky raised the idea of mediation earlier when he stressed the important role adults play in the transmission of culture to their children.

The aim of mediation is to transform a passive, dependent learner to an active autonomous one. The mediator manipulates the stimuli for the disadvantaged learner in order to facilitate learning.

> Our contention is that mediated learning experience is the foundation upon which cognitive structures are built and that, even as late as adolescence, major and significant cognitive modifications are possible. (Feuerstein, et al., 1980: 19).

The three characteristics essential for meaningful mediation are:

Intentionality and Reciprocity.

The mediator should clearly state his intentions, clarify instructions, and encourage the learner to participate in the process of learning. He should also show an interest in the learner, and challenge their ideas, norms and values in a constructive way. Reciprocity may be regarded as an additional characteristic since it refers to the role of the learner in the mediatory process. The learner should display an active role by clarifying his needs and intentions.

Mediation of Meaning.

The mediator assigns a purpose or significance to the activity of learning. He places the stimulus/activity within a meaningful context for the learner, and attaches importance to the learning material.

Mediation of Transcendence.

Transcendence refers to the content-free approach to teaching. An interaction should not only satisfy the immediate need of the learner, but also change his scope for dealing with a diversity of activities.

Various other strategies exist, but Feuerstein (1980) insists that for mediation to take place, the above-mentioned three must be present.

Another important aspect of the mediated learning experience involves cognitive functions.

Cognitive functions

Deficient cognitive functions are the products of insufficient mediated learning experiences. They form the basis of poor cognitive performance, and should be targeted when assessing performance or when planning an intervention program. An elaborative list of deficient cognitive functions have been compiled by Feuerstein and others, and are categorized into the three main phases of the mental act namely Input, Elaboration, and Output. Feuerstein, et al., (1980: 73)

Input Phase.

This phase refers to the assessment/analysis of a problem ie. looking at the givens. Impairments that may occur at this level include: blurred perception, deficient need for accuracy in data collection, etc.

Elaboration Phase.

Deficiencies at this phase may indicate impairments in problem solving techniques, ie. the student does not know " how to work things out " and does not have the ability to use the data collected in the previous phase in a meaningful way.

Impairments include: the inability to select relevant cues in defining a problem; impaired planning behaviour etc.

Output Phase.

This phase may be marred by deficiencies relating to the verbalization of solutions eg. blocking, trial-and-error responses and the lack of verbal tools for communicating responses. A graphic model illustrates the relationships between these phases. [See Figure (i)]

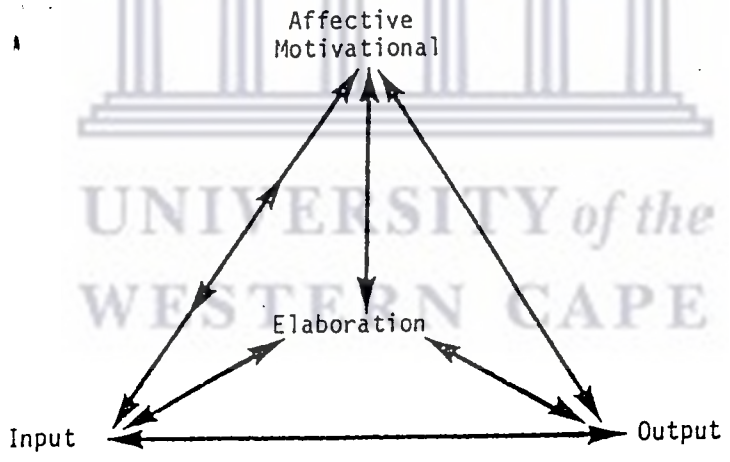


Figure (i) (Feuerstein, et al., 1980: 75)

Feuerstein attaches much importance to the elaboration phase, and regards the input and output as peripheral cognitive processes. The only reference to the affective - motivational factors is that they "...can combine negatively in such a way as to influence the attitudes of the disadvantaged." (Feuerstein, et al., 1980: 74).

Apart from the affective-motivational factors, the following is not well represented in Feuerstein's theory:-

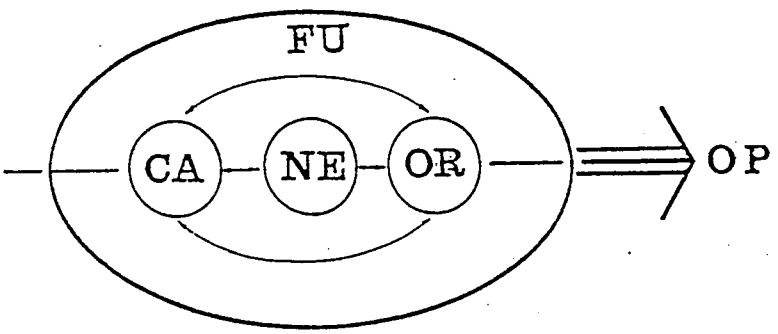
No reference is made to inert knowledge and skills eg. for individuals who are musically or artistically inclined.

Not enough emphasis is placed on the importance of basic / prior knowledge in the development of thinking skills.

Complex types of cognitive performance are not adequately addressed.

Rand (1991) suggests that the affective - motivational factors be incorporated within Feuerstein's list of pure cognitive functions, for example "lack of, or reduced need for pursuing logical evidence" suggests a measure of energy or inclination that is affective-motivational by nature, whereas, "pursuing logical evidence" may be viewed as the cognitive function.

The model that he suggests, shows the cognitive function (FU) and all of its basic components (CA, NE & OR) continuously interacting and mutually affecting each other. Operation (OP) refers to the behavioral outcome of the function and its components. [See Figure (ii)]



Cognitive Function (FU), capacity (CA), need (NE), orientation (OR), and operation (OP)

Figure (ii) Integrative model (Rand, 1991: 87)

If this model is related to that of Feuerstein, the list of deficient functions should be re-formulated and those pertaining to non-cognitive components be added.

In the same vein Tzuriel (1991: 98) highlights the importance of affectional-motivational factors by quoting three clinical scenarios. He suggests that the four components MLE, cognitive modifiability, affective and motivational factors/processes operate in a transactional fashion. The latter implies that the factors mutually affect each other, and that the transformed component reacts differently on the trigger component. For example mediation may affect motivational aspects positively, thereby reinforcing or encouraging mediation to match the response. [See Figure (iii)]

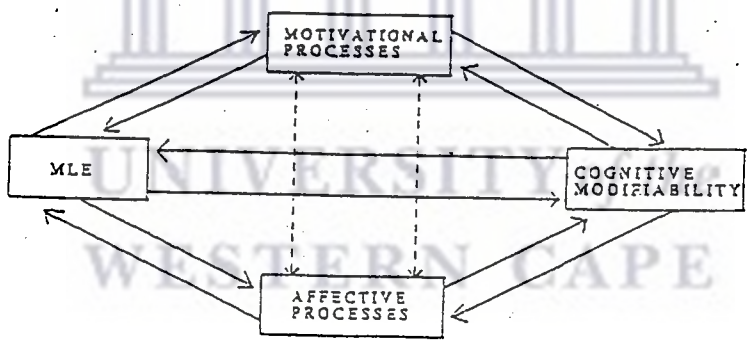


Figure (iii) Transactional model (Tzuriel, 1991: 106)

Tzuriel continues to list non-intellectual factors that affect MLE and cognitive modifiability processes, amongst others : the need for mastering, locus of control and fear of failure.

Various nursing educators have studied the relationship between locus of control and clinical decision making. (Tschikota, 1993; Neaves, 1989)

These models reinforce the importance of considering other factors (affective-motivational) when analyzing mental acts. Feuerstein's cognitive map represents a model for analyzing and ordering the mental act. (Feuerstein, 1980)

Cognitive map

According to Feuerstein the parameters by which the mental act may be analyzed include: content, operations, modality, phase, level of abstraction, level of efficiency and level of complexity. (Feuerstein, 1980). By employing the map along with the list of cognitive deficiencies, cognitive behaviour can be explained. This process oriented approach allows the mediator to locate the reason for the learner's inefficiency in any of the parameters. The latter may be illustrated by the following example:

Cindy prefers to model Soldato's gowns more than Levin's, but less than Arendz.

Arendz> Soldato> Levin.

Content: Is illustrated by listing and/or ordering.

Operation: By using mathematical symbols.

Modality: The written word is transferred to symbolic mode.

Phase: Input - By collecting data

Elaboration - By the manipulation of data

Output - By relating the answer either in the written or verbal form.

Level of complexity: How difficult is the problem?

Level of abstraction: How straightforward the solution?

Level of efficiency: How skilled has the learner become at solving this type of problem.

Since the model allows for a dynamic assessment of the learners' cognitive behaviour, the researcher used it to evaluate students' responses to problem-solving exercises. (See Chapter 3 and 4).

Feuerstein discusses the cognitive impairments that may be displayed by the learner under "phase". The aim of any intervention program would therefor be to turn these (impairments) around ie. to make them positive.

Because of the lack of subject specific research data in this field, the researcher used heuristic guidelines to be guided in a general literature search.

2.3 GENERAL RESEARCH LITERATURE

Looking at the givens in the research topic: firstly, student nurses experience difficulties when making clinical judgements, and secondly an intervention needs to be designed to address such difficulties.

Some of the conclusions that can be drawn from the above statement include the following:

Difficulties or errors in judgements may be relayed to the "mismatches" stressed by Klayman and Brown (1993), Shayer and Adey (1981).

It was therefore imperative to identify the difficulties students have when making clinical judgements. This was done by matching the cognitive demand of the task to the cognitive repertoire of the students. (See Chapter 3)

Some authors (Nickerson, et al., 1985) suggest that it is important to clarify what we know, and do not know about problem solving.

The "mismatches" were addressed by exposing students to a general thinking procedure (problem solving heuristic) and allowing them to internalize it through practise.
(See Chapter 4)
Such an intervention provides the students with an opportunity to apply the "thinking procedure" in context. Nickerson, et al.(1985), argue that the application of the heuristic principles in context may prove to be more useful than the principles themselves.
This underscores the view that training people in task specific processes is one of the strategies employed to improve human judgement. (Klayman & Brown, 1993)

To take this discussion a step further - these proposals can be critically examined in relation to current research data.

2.4 NURSING RESEARCH LITERATURE

Conflicting research findings exists around the topic of clinical judgement.

The major areas of interest include the following:
the impact of nursing education on clinical judgement; proficiency in making clinical judgement; the perceptions of students about clinical judgement; the effect of experience on clinical decision making, and locus of control.

The impact of nursing education on clinical judgement.

In a comprehensive review published by Kitgen-Andrews (1991: 153) she quoted seven of the studies which supported the impact of nursing education on clinical judgement and two which failed to provide any support in this regard.

Most of the studies examined the relationship between the level of education and clinical judgement.

Amongst those which support the impact of nursing education on clinical judgement were :

Verhonick, Nichols, Glor, and Mc Carthy (1968) who studied the clinical judgement abilities of 1,576 registered nurses when viewing a film of five clinical scenarios. Descriptive analysis indicated that clinical judgement abilities were positively linked to academic degree held.

Davis (1972), using Verhonick's material, found that clinical nurse specialists scored higher than nurses with a baccalaureate degree, and the latter scored higher than nurses with a diploma qualification.

Aspinall (1976), when using a single case study to evaluate clinical judgement, found that when 187 nurses were questioned about the possible causes of a patient's condition, nurses with a baccalaureate degree scored higher than associate degree, and hospital diploma nurses.

Del Bueno (1983) studied the effect of academic preparation and clinical experience on clinical judgement ability. She found that the experienced baccalaureate graduates performed best.

The two studies that fail to support the impact of education on clinical judgement were :

Frederickson and Mayer (1977) using Verhonick's material, found no significant differences in the clinical problem solving abilities of associate degree and baccalaureate students.

Pardue (1987) found no significant differences with regard to decision making amongst diploma, associate degree, baccalaureate and master's prepared nurses.

Proficiency in making clinical judgement.

Loving (1993) reviewed six studies dealing with subjects' proficiency in making clinical judgements. The independent variables examined in the studies include the following;

Using a decision tree (Aspinall, 1979), provision of an assessment tool (Hamdi & Hutelmyer, 1970), teaching problem oriented charting (Mitchell & Atwood, 1975), teaching hypothesis generation (Tanner, 1982) and teaching of cue recognition (Thiele, Baldwin & Hyde, 1986).

Of these studies only two produced significant results ie:

Aspinall (1979) found that when studying the decision making proficiency of 90 practising nurses, the subjects, for whom the decision making trees were available, performed better than the group for whom it was not available.

Thiele, et al., (1986) used computer simulations to study the effect of teaching cue recognition on the students' ability to recognize and sort cues.

The perceptions of students about the process of learning clinical judgement.

Loving (1993) stressed the fact that no qualitative studies describing the process of learning clinical nursing judgement were identified. The perceptions of students about the process of learning clinical judgement, was then researched by him.

He concluded that the evaluation oriented approach, highlighted students' efforts at learning patient-centred care and suggested that more time should be spent by staff to help students think through patient problems.

The effect of experience on clinical decision making.

An experient pattern of knowing has been described in studies regarding clinical decision making. (Benner & Tanner, 1987)

In this instance the decision making skills of novices were compared to those of experts. The former would rely heavily on theory, and on reducing situations into parts whereas the latter's decisions would be based on experience-driven paradigms of whole situations.

Locus of control.

The psychological construct of locus of control has recently been described as a factor affecting clinical decision making. (Tschikota, 1993).

Locus of control is a relatively stable personality characteristic which describes a person's beliefs about what determines the outcome of life events. If a person has an internal locus of control he/she perceives an event as a result of personal characteristics.

When fate, luck or chance is perceived as the cause of events he/she is said to have an external locus of control.

Tschikota's (1993) findings differ from that of Arakelian (1980) who suggested that persons with an internal locus of control are better able to extract relevant information and use data in problem solving than those with an external locus of control. Tschikota in her study found no significant difference in this characteristic. She, conceded however that subjects with an internal locus of control used more complex reasoning strategies than subjects with an external locus of control. (1993: 396)

Neaves (1989: 14) testing the hypothesis that " An internal locus of control is positively related to independent decision making in nursing students", found a statistically significant though somewhat low relationship between locus of control and decision making.

Tschikota (1993: 390) states that,

> recently a small nucleus of research-based information is forming that describes some of the cognitive strategies used by nursing students during the process of making clinical decisions.

There is indication of a shift in focus from measuring the product of clinical judgement to determining the processes employed to effect such a judgement.

2.5 IMPLICATIONS FOR THIS STUDY

A literature review shows a conspicuous absence of local research with regard to this topic. It becomes clear that the researcher is embarking on a new field of study and has limited literature available for comparisons.

Nursing research literature reflect that most studies were concerned with the product, rather than the processes of making clinical judgements. This motivated the researcher to investigate the difficulties students have with said processes.

A theoretical overview showed some of the earlier paradigms, behaviourism and gestaltism to have well defined boundaries. The more recent ones however, eg. constructivism and cognitive science, tend to blur at the edges. Even theorists like Piaget and Vygotsky agree on some issues, while presenting opposing arguments on others.

Taking the disadvantaged background of the subjects used in the study into account one should be mindful of the dichotomy of the learning situation; the learner, and what is to be learned (Mehl, 1989) ; the cognitive processes people use and the tasks to which these processes are applied. (Klayman & Brown, 1993; Shayer & Adey, 1981)

It is therefore advisable firstly, to determine the cognitive demand of a clinical problem-solving exercise and secondly to highlight the cognitive processes used by students whilst performing the exercise.

This should be followed by an attempt to address any " mismatches " identified, through intervention. (Klayman & Brown, 1993; Shayer & Adey, 1981)

Finally, it is interesting to note that heuristic guidelines were employed to address the problem of the limited availability of literature on this particular topic.

CHAPTER 3

THE COGNITIVE DEMAND OF THE TASK AND THE DIFFICULTIES DISPLAYED BY THE STUDENTS.

3.1. INTRODUCTION.

"He couldn't figure it out because he couldn't figure it out".

(Landa, 1976: 59)

This was the response of a teacher on being questioned about reasons why a bright and diligent boy failed to solve mathematical problems.

"Why can't they figure it out...," was the concern of this research presented here about the perceived lack of judgement skills displayed by students in the clinical setting. She questioned the fact that even though the students knew the theory around a specific health problem (subject content) and knew what must be done in order to solve the problem (cognitive operations) they were unable to do so.

This tallied with Landa's (1976) findings with regard to the problems students had with the solving of difficult mathematical problems.

Her other perception concerned the fact that once students were questioned about such problems, they would often arrive at the correct solution.

Clinical nursing revolves around the solving of health problems, ie. identifying the needs of patients, and planning appropriate nursing interventions.

For example; Patient X in a Urology ward complains of lower abdominal discomfort.

The student nurse would then report the patient's complaint to the person in charge of the unit.

In the meanwhile :

No assessment of the patient's condition is made; all the relevant information is not collected; simple interventions eg, changing the patient's position / determining whether the patient's urinary bladder is full, are not done.

This scenario reflects a typical clinical situation where the application of the relevant cognitive skills would ensure excellence in nursing care.

Other factors that may influence the student's ability to solve clinical problems include:

The teaching of the theory of nursing in a classroom setting without adequate opportunity for clinical tutorials; clinical teaching focusing mainly on the acquisition of psycho-motor skills; a lack of peer facilitation in the clinical setting; logistic problems eg. inadequate resources (both human and material.)

Tutors spend time teaching nursing theory, problem-solving models and clinical skills and then expect students to integrate these without actually teaching them how to do it.

Mehl (1985: 129) states that "Some students have never been taught to analyze data carefully or to plan an approach to the solution of a problem."

3.2 COGNITIVE DEMAND OF THE TASK.

(See Problem statement 1 - Appendix I)

In order to make a clinical judgement the learner/student needs to know:

A. Subject Content: ie.

The health / disease continuum; the physiological response of the body to any type of stressor eg. abdominal surgery; the nature of disease / pathology and the general post-operative as well as specific post-gastrectomy recovery expectations.

B. Cognitive operations: ie.

Cognitive functions on Input, Elaboration and Output.

Cognitive functions on input.

Students should be able to :

(a) make use of more than one source of information eg. they must be able to interpret the available patient-records;

(b) focus on relevant information eg. upper abdominal wound/ absence of fever and pain;

(c) systematically scan all the givens eg. decreased output along with lower abdominal discomfort;

(d) visualize an obese patient who, on the first post-operative day has an urinary catheter and intravenous line in-situ ;

(e) collect data accurately eg. fluid intake versus fluid output within 24 hours.

Cognitive functions on elaboration.

At this level students should be able to:

(a) identify and define the problem ie. recognize abdominal discomfort as a problem that needs to be addressed;

(b) utilize the relevant cues in a goal directed way to define the problem ie. make a correct interpretation of the available data;

(c) compare and analyze / summarize the information available to them, ie. conclude that the patient's fluid output is inadequate for that particular day;

(d) pursue evidence to explain the above fact;

(e) display the planned behaviour to alleviate the patient's discomfort.

Cognitive functions on output.

Students should be able to verbalize their plan/s of action. This should be done in a clear, logical and systematic way, and they should refrain from using trial-and-error responses.

By sketching a clinical scenario on paper and having the relevant patient records available, the student is forced to apply his/her thinking skills to its fullest potential.

C. A specific thinking procedure.

To make clinical judgements the student needs to internalize an approach to the problem, which will allow him/her to manipulate the information (as listed under A) by employing the skills (as listed under B) in a very specific way.

3.3 DIFFICULTIES DISPLAYED BY THE STUDENTS.

General.

From the perceptions mentioned earlier, and the subsequent analysis of subject content it follows that the students' judgement skills be tested on a fixed task. The latter being a simulated clinical problem-solving exercise. However, simulations should be designed in such a way that subjects would be able to solve problems and plan interventions with reasonable accuracy. (Tschikota, 1993)

Critique against using simulations include ; the inability to account for various variables that may influence the learner's judgement. (Tanner, 1987).

Advantages include the fact that it presents the learner with a safe and non-threatening environment and allows the researcher to study several students' responses to a fixed task. (Tanner, 1987) It also allows the researcher to manipulate the givens in a way that in any real clinical setting may prove life threatening to the patient eg. a scenario depicting fluid overload in a patient post-operatively.

A deliberate attempt was made to select scenarios where "lack of knowledge" would not be present as a variable.

Subjects and Procedure.

Subjects were selected from a class of 14 third year nursing students at the University of the Western Cape. Initially 10 students participated in the program.

English, although a second language was used by most students.

The process of acquiring analytical thinking skills is difficult to address because it involves an activity generally done "in the individual's head". This activity is only exposed if individuals vocalize their thoughts ie. "think-aloud".

In order to establish whether the researcher's perceptions were accurate, **interviews** were conducted with a number of student nurses. The value of research data obtained from interviews was not really appreciated until the Piagetian era, when it was realized that it is not only the solution of a problem that offers research data **but** it is also the processes employed that is of value to research. This provided researchers with insight into the complex cognitive operations applied by subjects in the problem solving process (Konold & Well, 1981).

A number of researchers proposed that cognitive processes could be described as sequences of heeded information and that verbal reports correspond to this heeded information. (Ericson & Simon, 1984).

In "Think-aloud" interviews probing is kept to a minimum, and subjects are encouraged to verbalize their thoughts. The interviewer is not interested in the answer, but rather in the process of getting to that answer.

This does not only provide her with information stored in the student's (STM), but it forces the student to link onto information stored in the (LTM) (Ericson & Simon, 1984). The think-aloud interview was used to gain insight into the student's approach to the problem, his manipulation of the data available to him as well as the plan of action proposed by him.

To investigate the researcher's second perception (that if students are questioned about health problems they often arrive at the correct solution) "in-depth" interviews were conducted. These represent highly interactive types of interviews. The subject is probed at a deep level as he/she attempts to solve a problem. The subject is asked to explain, motivate or substantiate his/her responses but, the interviewer refrains from assisting him/her by way of hints, evaluative remarks or body language. (Konold & Well, 1981).

Data was collected by the interviewer, and no time limit was imposed on students. The subjects were informed that the outcome of the exercise was not as important as the process of problem solving. They were also informed that the information provided, was the only data available to them.
Students who participated did so voluntarily.

Each interview was tape-recorded and transcribed. The transcripts were divided into "thought segments" and analyzed by using Feuerstein's deficient functions / cognitive map as a frame of reference.

The interviews as well as the analysis was done by the researcher. During the analysis it is important to constantly compare individual protocols on a specific issue to the "trend" displayed by all the other subjects on the same issue.
Konold and Well (1981: 10) state that such a strategy,

> keeps us at a level of analysis that allows us to generalize our understandings beyond the individual, yet does not result in information that is too global to be of any value.

Simulations were constructed in consultation with her colleagues as well as unit managers from a local health facility.
The researcher taught Clinical Nursing Science to these students for the two years preceding the study.

Problem used:

The student was given a problem statement and asked to read it carefully. Additional information was supplied in the form of patient records. The student was then asked to think-aloud while addressing the patient's problem. Pen and paper were made available should the student wish to make any notes.
A practise session, during which the interviewer felt free to intervene, was done to illustrate the method to be used.

The problem statement along with all the patient records appear in Appendix I.

Analysis and results of "Think-aloud" protocols.

(Individual protocol analyses in Appendix II -
NSA & NSB refer to Nursing student A & B)

In this instance the reasons for the breakdown of problem analysis resemble those listed by Whimbey and Lockhead (1982: 11) namely :

1) Failure to approach problems in an organized way.

(NSA) made a sweeping perception "maybe there is bleeding" without exploring the information in a systematic way.

Initially (NSB) appeared to be focused, however, she did not follow through by exploring all the givens.

Feuerstein (1980) regards this type of behaviour as the product of inadequate training in exploratory skills.

2) Failure to observe and use relevant information.

(NSA) observed some of the relevant information, but did not use it in a constructive way. He simply stated that "the urine output is a little bit down" but failed to conclude that the patient may be experiencing urinary retention or, if still catheterized, that the catheter may be blocked.

(NSB) failed dismally in this area. She did not consult the patient records at all. This resulted in inadequate data collection during the input phase. All the relevant cues are contained in the patient records ie. all the answers to her queries eg. "Find out her bloodpressure, her pulse,..... make sure she is still nil per mouth".

3) Failure to spell out relationships.

(NSA) occasionally failed to spell out relationships. From, "the mass of the patient is 100 kg", he did not deduce that the patient was obese. (NSB) referred to the same patient as "a frail old lady".

The fact that the patient had not passed any urine during the previous six hours, received the following response, from (NSA) " the urine output is a little bit down"

4) Imprecision and inaccuracy in performing mental activities.

(NSB) did not compare, summarize, pursue logical evidence, or apply any other elaborative processes because of the limited information collected during the input phase.

One of (NSA)'s biggest problems was that he did not co-ordinate the data obtained during the input phase. He attended to information contained in the records but failed to relate it to the patient's main problem.

Protocol analysis of the "think-aloud" interviews showed that:

Students knew most of the theory around the problem; they displayed some of the cognitive operations but that there was no evidence of organized problem solving behaviour.

Analysis and results of "In-depth" interviews.

(Individual protocol analyses in Appendix II -

NSC & NSD refer to Nursing student C & D)

In this instance the reasons for the breakdown of problem analysis include:

1) Failure to approach problems in a structured way.

(NSD) had a novel way of approaching the problem. He did so by way of elimination, ie. he considered the various post-operative complications and eliminated them by utilizing the data from the patient's records. (NSC)'s approach appeared to be fairly structured as well.

2) Failure to observe and use relevant information.

Both (NSC) and (NSD) failed to observe all the relevant information during the input phase. They determined the age of the patient, but not her mass. The latter being a fairly important factor in the postoperative care of the patient.

3) Failure to spell out relationships.

(NSD) appeared to be uncertain when drawing conclusions about data collected." So there is a slight possibility of maybe... maybe the bladder is full" and "...the patient is lying incorrectly." However, once he was questioned about his statements he supplied the interviewer with the correct motivation for making them. Similarly it was only after (NSC) was probed that he came up with the correct relationship between the patient's fluid intake and output.

He started off by saying, "I cannot say that the patient has not passed....(subject laughs) No, I guess no ... Yes I think now", and then provided the correct answer.

4) Imprecision and inaccuracy in performing mental activities.

In both cases the students started off in a goal directed way and apart from the fact that they failed to collect some of the givens, the input phase posed no real problems to them.

However, during the elaboration phase, a number of probes were required to facilitate the problem-solving process.

In both instances the subjects refrained from proceeding to the output phase. Problems were identified but not adequately addressed. Probes like " So you are saying... change the position ?", and, "...what about the other problem that you have identified?" were provided by the researcher.

Protocol analysis of the clinical or in-depth interviews indicated that,

Students knew the theory around the problem;

they displayed most of the cognitive operations (especially after being probed by the interviewer) however, there was still little evidence of organized problem-solving behaviour.

3.4 DISCUSSION.

The insights gained from the interviews were extremely illuminating. It provided the researcher with an information base.

At this stage the subjects were not exposed to any influences, and the data confirmed some of the concerns raised by the interviewer at the beginning of the Chapter.

Although all the transcripts were not attached, the four that were discussed, reflect the trend set by the other respondents. The protocol analyses highlighted the "mismatches" between the cognitive processes the students used and the tasks to which the processes were applied. (Klayman & Brown, 1993).

The decision to employ " domain " specific heuristics as an intervention mechanism, follows on the suggestions by both Perkins and Salomon, (1989) and Klayman and Brown (1993).

3.5 IMPLICATIONS FOR INTERVENTION

In order to illustrate the need for some kind of intervention let us consider Perkins's design questions (1986).

Purpose.

The purpose of intervention at this level lies in the fact that learners should be provided with a general thinking procedure that may be employed to solve a variety of clinical problems.

Structure.

The structure of such a program should allow learners to acquire a skill that will enable them to manipulate content knowledge by employing cognitive operations in a very specific way.

Model Case

Students must be provided with detailed model cases addressing specific health problems of individuals.

Arguments.

The arguments for employing this type of intervention program are manifold, amongst others :

To provide learners with the opportunity to internalize a problem solving procedure though practise;

To make the thinking and problem-solving processes overt to the learners, and

To encourage peer-group discussion.

CHAPTER 4.

AN INTERVENTION

4.1 INTRODUCTION.

From the previous Chapter it becomes clear that students do experience difficulties when making clinical judgements.
The question remains "How does one address these difficulties?"
One of the answers lies in teaching students a problem solving skill and allowing them to internalize it through practise.

Whimbey and Lockhead (1982) were concerned about the difficulties learners experienced with problem solving. Since analytical thinking form the basis for problem solving, they argued that if the learner's thinking skills can be improved their general problem solving abilities will improve.

However, the teaching of a new skill entails the following:

The demonstration of the skill by an expert in the field and the practise of the skill by the learner under the close supervision of the expert (teacher).

As stated earlier, analytical thinking involves an activity which is generally done "in the individuals head" and is only exposed once they vocalize their thoughts.
In an attempt to address this phenomenon, Whimbey & Lockhead (1982) used the following strategy:
Experts were asked to think-aloud while they solved difficult problems. The transcripts were then summarized into problem solving steps (Solution 1).

This was followed by a "peer-pair" attempt at solving the same problems. (Solution 2). In a "peer-pair" situation one learner assumes the role of the problem solver, and the other the role of the listener.

To identify any shortcomings in the process a protocol analysis of "Solution 2" is then compared with that of "Solution 1".

In the "peer-pair" exercise both partners benefit in that:

> The problem solver is able to monitor his progress, and the listener learns about the technique used and is allowed to identify the errors made by the problem solver.

The listener has to ensure that the problem solver keeps on expressing his thoughts aloud. He should also ask for clarification and insist on a detailed explanation whenever he is unsure of what the problem solver is thinking about. (Whimbey & Lockhead, 1984).

This method could prove to be extremely useful because it allows one, firstly to list the methods used by good problem solvers and secondly to identify the difficulties common to poor problem solvers.

In a similar experiment Landa (1976) investigated the fact that some of the best students failed to solve difficult mathematical problems. He stated that the reasons for their failure may be divided into two groups ie.

> those relating to shortcomings in knowledge and its organizations, and those relating to inadequacies of cognitive operations.

He concluded that students lack a system of operations and a generality of application of these operations. In order to address these inadequacies and develop a system of rules, he analyzed the procedures that good students follow in order to solve mathematical problems. These rules were taught to all of the other subjects in the experiment and a follow-up investigation showed a marked increase in their ability to solve similar mathematical problems.

In this study the researcher transfers the strategies suggested by Whimbey and Lockhead (1982) and Landa (1976) to the field of Clinical Nursing Science.

4.2 A HEURISTIC APPROACH.

Simon (1979) states that a heuristic denotes any principle or devise that contributes to the reduction in the average search for a solution.

It is however, important to distinguish between algorithms and heuristics.

Algorithms refer to step-by-step procedures (prescriptions) that guarantee solutions. If these steps are followed to a tee one should accomplish that which one has set out to accomplish.

Heuristics on the other hand constitute guidelines which, if followed closely, does not guarantee a solution but brings one closer to a solution. It may even provide one with a reasonable chance of accomplishing that which one has set out to accomplish (Nickerson, et al., 1985).

The researcher's reasons for devising a heuristic tallied with those of Landa (1976).

Landa questioned the fact that although students knew the theory around a specific problem, and knew what needed to be done in order to solve it, they were still unable to do so. This phenomena was illustrated by the students' responses to a problem-solving exercise.

In addressing clinical problems, some of the problem-solving rules/steps suggested by Landa appear to be appropriate namely:

1. Look at what is givens and what is to be proved and separate the two
2. Draw the most direct and obvious conclusions from the given information
3. Critically examine the information obtained (lists compiled) in the previous steps, and analyze, compare and draw inferences from the information
4. Break the problem up into sub-problems and repeat from step 1
5. Prioritize solutions (interventions)
6. Choose the most appropriate solution (intervention/s).

The following example illustrates how this heuristic may be applied in clinical problem solving.

4.3 A HEURISTIC APPROACH - APPLIED.

(See problem statement 1, Appendix I)

Step 1.

List all the givens against the problem to be addressed.

The patient is a 48 year old woman who has had a gastrectomy. The following day (16h00) she complains of lower abdominal discomfort. However, "the day following surgery" could be interpreted as the first post-operative day.

Step 2.

Draw obvious conclusions from the givens.

Visualize the patient. In this instance it is a 48 year old female patient weighing 110kg (obese). It is the first post-operative day after abdominal surgery. One would therefore expect her to have an upper abdominal wound.

Mrs Smith would be lying in a semi-fowlers position in bed, and she would still be kept nil per mouth. One would expect her to have the following-in-situ: intravenous line, naso-gastric tube and a urinary catheter.

A gastrectomy patient could also present with the following post-operative problems ie. pain, nausea, and haemorrhage.

Additional information obtained from the patient's records include the following;

The vital signs are within normal limits.

Intravenous fluid intake between 08h00 and 16h00 totals 1000ml while the urinary output for the same period is only 300mls.

This indicates a fluid deficit.
Pethidine was administered for pain two hours prior to the patient's complaint.

Because of the vast amount of data available, a list of the most relevant information may be compiled.
(Obtain additional information from the bedside records.)
In order to apply this step, students should have a sound knowledge base as well as the ability to apply general cognitive operations. At first the list may appear to be exhaustive. However, the more practised the student becomes in the application of the rules, the more compact the list will become.

It is also important to focus on the cognitive difficulties displayed by students during step 1 & 2. They should be encouraged to :
Visualize an obese woman who has undergone abdominal surgery, utilize all the available sources of information to gather accurate and precise data. The prescription chart and fluid balance record should be consulted to determine the patient's fluid intake, which could then be compared with the fluid output for that particular day.
Steps 1 and 2 will also ensure a systematic approach to the problem.

Step 3.
Critically examine the list, analyze, compare and draw inferences.

The following may indicate the most probable causes for discomfort: the patient's position in bed; discomfort as a result of pain and obesity; a blocked urinary catheter.

The application of theoretical and clinical knowledge will ensure that a decreased fluid output be recognized without fail. Practical experience with regard to post-operative patient care will also be helpful. The need for pursuing logical evidence is illustrated by a systematic investigation re. the location of the discomfort. The fact that it is not related to the surgical wound ie. upper abdominal wound vs. lower abdominal discomfort.

Step 4.

Break problems up into sub-problems and repeat from step 1.

It becomes clear that at this stage each of the "probable causes" becomes a sub-problem.

The latter may be addressed in the following manner:

If the urinary catheter is in-situ, determine whether the catheter is blocked.

If the urinary catheter has been removed, establish the possibility of urinary retention.

Since the urinary output is not adequate, determine whether the bladder is distended.

From the information available it is not clear whether the urinary catheter is still in-situ. However, the most obvious reasons for this "probable cause" may be relayed to: a blocked urinary catheter, or post operative urinary retention

During steps 3 and 4 students must be encouraged to :

Apply their knowledge in the pursuing of evidence;

Compare data and eliminate incongruencies and

Select relevant information and display planning behaviour.

Step 5.

Prioritize solutions / List interventions

Blocked catheter - unblock

Urinary retention - Apply conservative measures to facilitate urination / catheterize

Position in bed - change position.

Step 6.

Choose the most appropriate solution or range of solutions.

During the last two steps of the procedure students should refrain from using trial-and-error responses. They should be encouraged to report their solutions / interventions accurately, clearly and concisely.

These steps represent a heuristic approach to the solving of clinical problems. It fits in with the definition of the concept since it constitutes guidelines or rules which, if followed closely, does not guarantee a solution but brings one close to one.

The reader may argue that these guidelines resemble most other problem-solving models for example:

Polya's problem-solving heuristic (1957)

Miles' "Nursing process" (1984)

Even though some students were previously exposed to Polya and Miles' models, they displayed very little transfer of the knowledge to the clinical area. The objective of this exercise is therefore not to teach an alternative model for problem solving but to facilitate the application of a particular problem solving heuristic, one that may be applied to a variety of clinical scenarios.

The aim being to allow students to use the heuristic guidelines in a flexible manner and possibly devise their own set of guidelines.

The other hidden agenda is to address the cognitive deficiencies displayed by students - something that is not always implicit in the models quoted earlier.

4.4 AN INTERVENTION

The intervention was planned for the first half of the second semester.

The first session was used to discuss the program, and decide on a appointment schedule. The latter proved to be problematic because of the students' full academic program.

In short the program contained the following.

(a) Group session: Demonstration of the problem-solving heuristic
(b) One peer-pair session : Using Whimbey and Lockhead's problem-solving exercises
(c) Four peer-pair sessions: Using clinical scenarios (Done on a weekly basis)
(d) Individual think-aloud interviews : Using a clinical scenario, similar in nature to the first one
(e) Evaluation questionnaire to be completed by students.

(a) GROUP SESSION.

The researcher used the "think-aloud" method to demonstrate the application of the problem solving heuristic. (Whimbey & Lockhead, 1982) The various cognitive skills required to perform each of the problem solving steps were highlighted by the researcher by making her own thinking processes overt and explicit. Students had the opportunity to identify some of the difficulties they experienced during their problem solving attempt.

This was followed by a discussion on:
the common cognitive difficulties displayed by students;
and the methods employed by good problem solvers. (Whimbey & Lockhead, 1984)

The students were given a copy of the problem-solving heuristic as well as a copy of the Problem statement 1. with all the relevant patient records.

(b) PEER - PAIR SESSION.

Students were exposed to the "peer-pair" method used by Whimbey and Lockhead in their experiments on problem solving. Examples were taken from Whimbey and Lockheads' book "Problem solving and comprehension" (1982) A copy of the "Problem solution" was supplied to the students for monitoring their own performance against those of expert thinkers.

(c) PEER-PAIR SESSIONS USING CLINICAL SCENARIOS.

These sessions were scheduled on a weekly basis.

Students were given problem statements from a number of clinical situations, along with the relevant patient records.

The "peer-pair think-aloud" sessions were recorded to allow the researcher to reflect on the findings as well as to plan future problem scenarios. The scenarios where designed to try to address the difficulties listed in Chapter 3.

Feedback followed every peer-pair session when the researcher would highlight the "problem-solvers" difficulties in terms of content, cognitive operations and structured thought. Both partners had the opportunity to take part in this discussion. Some of the co-incidental findings of this session will be discussed later.(See 4.6 Discussion)

(d) INDIVIDUAL "THINK-ALOUD INTERVIEWS.

Subjects

Eight interviews were conducted by the researcher. All of these students attended the program for at least one quarter.

Materials

A postoperative scenario similar to the one used earlier (Problem statement 1) was formulated.

In this instance a different post-operative complication had to be addressed. The cognitive operations that this task demanded, closely resembled those required to solve the first clinical problem.

An illustration of the heuristic approach to the problem follows:

A Heuristic approach : applied.

(See Problem statement 4, Appendix IV)

Step 1.

List all the givens against the problems to be addressed.

The patient is a post-menopausal woman who has undergone a total abdominal hysterectomy and bilateral salpingo- oophorectomy. Her problem lies in the fact that she has developed a purulent, discharging wound sinus.

Step 2.

Draw obvious conclusions from the givens. Consult all the relevant patient-records.

Firstly visualize the patient. In this instance it is a 56 year old female patient weighing 100 kg (obese).
It is the third postoperative day following abdominal surgery. One would therefore expect her to have a lower abdominal wound. She has been mobilized since the first post-operative day and one would expect her to be nursed in a semi-fowlers position. Mrs Smith has also started taking a fluid diet on the second post-operative day. Her intravenous line is still in-situ, because she is receiving intravenous antibiotic therapy.
The urinary catheter has been removed.
She has received a total fluid intake of 550ml (200ml intravenously and 350ml per mouth.) Her fluid output at 08h00 was 100ml. The fluid balance for the previous day was within normal limits.

She has developed an elevated body temperature 38°C, and tachycardia of 102 beats per minute. The respiration rate and bloodpressure are within normal limits.
Since pain is one of the postoperative symptoms to be attended to, it is important to note that the problem statement reads " ...no other post-operative complications ".

Secondly, visualize the wound on the second postoperative day. Signs of redness and discharge was observed at the distal end of the wound. This was most probably the area where the wound sinus started to develop. The wound was cleaned with solution of Povidone-iodine in sterile water. (according to ward protocol)

Step 3.

Critically examine the information discussed under step 2. Analyze, compare and draw logical inferences from the information (data) collected.

The most obvious conclusion that can be drawn from an analysis of the data is that the patient has developed wound sepsis. This is substantiated by a elevated body temperature, tachycardia, and the development of a purulent discharging wound sinus.

Obesity can be seen as a factor in delaying the process of wound healing.

Students should be able to identify the most probable problems and choose the most appropriate intervention/s

Step 4.

Break the problems / interventions into parts, and repeat from step 1.

The following should be addressed in a structured, and systematic fashion; wound sepsis, fever and the patient's general health status. An attempt should be made to motivate and guide the patient re. controlled weight loss.

Step 5.

Prioritize solution/list interventions

Fever -Tepid sponge bath

Supply plenty of fluids to drink

Administer anti- pyrexic medication eg. Panado

Monitor temperature and pulse rate 2-4 hourly

Wound healing- Employ aseptic dressing technique

Patient advocacy re. wound irrigation 3-4 times a day

Take puss swabs of wound and send to the laboratory for microbiological tests

Administer the prescribed antibiotics.

Obesity - Be aware of potential breakdown of the wound healing process.

The patient should be placed in a position that will facilitate wound drainage.

Supply a balanced diet.

Step 6.

Choose the most appropriate interventions/ list of interventions. It is important in this instance to monitor the patient's progress.

Methods.

"Think-aloud" interviews were conducted with all the students who participated in the program. The same conditions prevailed as for interviews (A - D) The aim was to evaluate thought structure and probing was kept to a minimum. This allowed the students to organize their approach and management of the patient's health problem/s.

Results.

Two of the ten participants withdrew from the program. Eight think-aloud interviews were eventually conducted.

However, one of the eight preferred to use her first language (Afrikaans) during the interview. As a result of technical problems during the recording of the final interview, only the interviewer's notes was available for analysis.

The concerns of Whimbey and Lockhead about the breakdown of problem analysis will be highlighted during the discussion of the results. Protocol analyses was done using Feuerstein's cognitive map as a frame of reference.

(Detailed individual protocol analyses included in Appendix V, NS1 - NS6 refer to Nursing students 1 to 6.)

A synopsis of the results of the interviews will be discussed under the following headings:

Subject Content.

Although the clinical scenario was constructed to eliminate "content knowledge" as a variable, (NS4) and (NS5) displayed a very superficial and narrow view of postoperative nursing care. (NS4) made statements like "If the temperature decrease the pulse rate will decrease" and " take some swabs and send to lab". (NS5) tended to focus on one postoperative complication and failed to advocate any other nursing interventions.

The other students (NS1), (NS2), (NS3) and (NS6) displayed an average to good grasp of content knowledge, and postoperative nursing care. (NS2) had problems with semantics. His interpretation of "mobilize the patient" was limited to

" mobilization by the physiotherapist".

He did not realize that putting a patient into a chair implies "mobilization of the patient."

Cognitive Operations.

Without exception the students' approach to the problem solving exercise was influenced by the intervention program.

They seemed to have internalized the problem-solving steps.

As soon as (NS6) realized that he was resorting to trial-and-error problem solving behaviour, he corrected himself.

The fact that a heuristic procedure does not "guarantee" a solution, was also proved correct ie. (NS5) followed the steps, but got caught up in one particular sub-problem.

Modality.

Most of the students employed a combination of modalities and did not show a preference for any particular one.

They obtained information from the written, graphic, as well as numeric formats.

Phase.

Without exception the students made use of all the information available to them. The thinking skills displayed by students during the input phase improved, with the exception of (NS5), who did not visualize an obese woman in need of comprehensive postoperative care.

(NS1) and (NS2) were exceptional in the spontaneous use of special/time referents. (NS1) stated "now I am going to look in the records to see when was the operation done... It was done about four days ago, no ... three days ago".

However, (NS3), (NS4) and (NS5) did not establish the fact that they were nursing an obese woman.

All the students made use of more than one source of information and there was a clear attempt to obtain accurate information from the documents. (NS1) stated that "temperature starts to rise from the third day to 38°C and the pulse rate is also increased to 104" and " the bloodpressure has been constant at 125/85".

(NS2) said " I would like to find out when was the operation done, because the 29th which is today.... the patient's temperature is high".

(NS3) stated " The problem here is that the patient's temperature is high."

(NS4) said " It is ... (counts 1,2,3,) it is day three after the operation.

If these protocols are compared with the first "think-aloud" protocols, (Appendix 1) there is a marked improvement in cognitive operations applied during the Input phase of the problem solving exercise.

Step two and three of the problem solving heuristic relies heavily upon elaboration processes. To "draw conclusions from the givens" and "compare information obtained from the aforementioned step", the student has to employ a number of elaborative processes. This is demonstrated by (NS1) who stated that

> if the temperature keeps on increasing, it may be a sign that there is infection in the wound, and from the dressing record you see that there has been yellow discharges from the second day.

Even (NS5) said " when I check the temperature I find that it is very high.. it's 38°C, and the pulse rate also increased". (NS6) on the other hand did not apply the elaborate processes consistently. His conclusion to "pack the dressing tightly" is not the dressing technique of choice once a patient has developed a wound sinus.

There appears to be a common tendency to conclude that the patient has developed a fever as a result of a wound infection (NS1-NS6).

The imprecision and inaccuracy in performing mental activities have also been minimized.

Without exception all students employed input, elaborative as well as output processes. The latter being poorly demonstrated during the pre-intervention interviews.

(NS1), (NS2), (NS3), (NS4) and (NS6) planned to address the patient's fever, some to a greater extent than others.

(NS5) however, did not attend to the patient's fever at all (although she recognized it as being "very high.. it's 38°C")

(NS1), (NS2) and (NS6) highlighted the implications of nursing an obese patient post operatively. (NS2) stated "because the patient is fat the positioning of the patient...."

(NS2), (NS3) and (NS5) recognized the need for patient advocacy because the dressing prescription needed to be changed from " Clean dressing" to a " wound irrigation..."

However, in general, there is a conscious effort on the part of all the respondents to plan nursing interventions, instead of relying on a trial-and-error type of response.

Level of complexity, abstraction and efficiency.

(NS1), (NS3), (NS4) and (NS6) managed to manipulate the data with relative ease, because the content was familiar to them. Lack of content knowledge and inadequate cognitive skills at input level negatively influenced the problem solving attempt of (NS5). This resulted in a one-sided approach to the problem.

(e) EVALUATION QUESTIONNAIRE.

Questionnaire. (See Appendix VI)

All eight participants completed the questionnaire. In general the students responded positively to the questions.

1. Without exception students felt that the program had been helpful to them.

Their comments ranged from :

To look at patient's problems broadly before intervening;
It fostered self-reliance and independent functioning in the clinical area;
Stimulated critical thinking;
Gained insight into problem resolution, to...
Realized the importance of consulting patient's charts and it helped with the interpretation of vital signs.

2. Two respondents did not offer any suggestions about improving the program. Some (4) felt that it should have been open to all other students. Others said that time scheduling could have been better (2).

3.Regarding suggestions for the future planning of such a program, two (2) felt that the program should "...form part of the academic program". All the others, six (6), suggested that it should have included students from all levels.

4. (a) One (1) respondent summarized the strengths of the program as follows, " It made me think in a structured way .... be more observant, and not to make hasty decisions".

Others listed the fact that they :

Have achieved something;

Developed insight into problem solving and

Have learned to solve problems by using theoretical knowledge.

4. (b) Three (3) said that the program was too short. The rest (4) suggested that there were no weaknesses, One (1) did not respond.

5. The general comments ranged from :

All students should be exposed to such a program ;

It should be extended / compulsory to all students , to...

The benefits are overpowering.

From the response it is clear that students need facilitation in the solving of clinical problems. The ideal would be to conduct a follow-up program in a health facility.

It has also been suggested that students from all academic levels should be exposed to such a program.

This reinforces the researcher's perception that "thinking procedures" should be taught in a subject specific area.

4.5 DISCUSSION.

Once more the suggestions of Perkins and Klayman proved to be fruitful ie. Perkins and Salomon (1989) stated that the lack of problem solving strategies (and gains from applying heuristic rules) should be documented before and after such interventions, while Klayman and Brown (1993) suggested that cognitive processes be modified to fit the task, by training people in task specific heuristics.

The results of the Post-Intervention interviews illustrated that once the students' thought-processes were structured, they applied the appropriate cognitive operations demanded by the task.

The need for probing (for the learner to proceed through all the phases of the mental act) was minimal. This phenomenon was labelled by the researcher as the hidden agenda of the intervention program.

Mastering of clinical judgement skills was reflected by the systematic approach to the problem-solving exercise.

During the input phase the students' searched for the relevant data. Although they did not verbalize the fact that they were visualizing the patient, the interviewer sensed that some of the students made a conscious effort to obtain physical data about the patient. Statements like " She is twice my size" confirm this.

They became aware of the importance of consulting all the patient's records, interpreting the data and selecting the relevant information. These elaborative processes were performed in a focused way. Students also attempted to address the different sub-problems, or intervention options in a structured fashion.

There was a marked improvement in the operations employed during the output phase, since students refrained from employing "trial and error" responses. They implemented a planned intervention and highlighted the importance of monitoring the patient's response to the proposed intervention.

With the exception of one respondent, all the students applied the heuristic guidelines which indicated that the guidelines had become internalized through practise. It is also noteworthy that the rules were applied in a rather flexible manner, which confirms the previous statement.

It can therefor be concluded that the concerns of Whimbey and Lockhead (1982) discussed in Chapter 3, were addressed by the intervention .

Positive student feedback through their responses to the questions contained in questionnaire, as well as personal anecdotes of how the program influenced their problem solving abilities, confirmed the need for such (or similar) programs in the field of clinical nursing science.

Although it is not within the scope of this study to analyze the protocols of the peer-pair practise sessions, the following incidental findings proved enlightening.
(Since the findings reflect some of the indirect results of the intervention program it was difficult to find an appropriate place to report on it.)

(See Problem statement 3A, Appendix III)
This clinical scenario closely resembled the first one which dealt with post-operative nursing care.

With the exception of two, all the students had difficulty in making clinical judgements because they refrained from consulting all the relevant patient records (eg. the fluid balance chart.) This factor influenced the elaborative processes, and they resorted back to making trial-and-error judgements.

During the group discussion the students confessed that relatively little attention was given to that particular chart. However co-incidental, this finding warrants serious attention in the field of clinical teaching.

The importance of subject specific knowledge and semantics were also highlighted when a student did not know the meaning of the word " frothy " and subsequently could not associate it with the sputum typical of lung oedema.

(See Problem statement 3B, Appendix III)

Most of the subjects displayed sound clinical judgement. However, although they suggested the application of pressure over the puncture area, the subject specific detail was not forthcoming.

One of the students related a clinical experience similar to the one described in the scenario. He was administering medication when a junior nurse reported that a patient who had had a special investigation, requested an analgesic. He said that ordinarily he would have given the tablets without doing a proper assessment of the patient's needs. In this instance he reflected on the peer-pair session and discovered that the patient had developed a life-threatening haematoma, following cardiac catheterization.

Both cases involved the puncturing of the skin in order to perform a special investigation. The simulated scenario involved the puncturing of a highly vascular organ (liver) whereas the real life scenario involved the puncturing of a major vein (femoral vein).

This finding shows that the student has displayed transfer of the problem-solving skills from a simulated exercise to the real clinical setting.

CHAPTER 5

CONCLUDING DISCUSSION.

5.1 INTRODUCTION

It is not possible to generalize the findings of this study because of the small sample size. However, more than half of the third level nursing students participated in the program.

The researcher systematically set out to establish the reasons for students failing to display effective clinical judgement (cognitive) skills. A phenomena that has been researched locally in various other disciplines.(Wesso, 1992; Mehl, 1985)
Feuerstein's theory proved to be very useful in placing the difficulties into perspective.

A mismatch (Klayman & Brown, 1993) was identified between the cognitive demand of a clinical problem-solving exercise and the cognitive repertoire of the students.

An intervention was designed to address the difficulties students have when making clinical judgements by exposing them to a content specific problem-solving heuristic - one that students would be able to apply in a variety of clinical situations.
The intervention was aimed at facilitating the application of aforementioned heuristic through practise.

The latter complies with Nickerson's (1985) argument that the application of heuristic principles (rules) in context may prove to be more useful than the principles (rules) themselves.

The practise sessions were structured using Whimbey and Lockhead's method (1982) and follow-up interviews were conducted to determine what effect intervention had on the students' performances.

5.2 THE MAIN RESULTS.

The researcher could identify the difficulties displayed by students during the " think aloud " interviews. These difficulties resembled those described by Whimbey and Lockhead (1982) in their book " Problem solving and Comprehension."

What became clear however, was that as soon as in-depth interviews were conducted, the students' performance improved which led the researcher to suspect that there was a lack of structured thought.

The students were then exposed to "thinking procedures" (heuristics) which served as structured guidelines with which to approach problems. In order to follow these guidelines, students were compelled to apply specific cognitive operations.

Various clinical simulation scenarios were created to allow students to internalize the rules through practise.

The effects of intervention may be summarized as follows:

The students were made aware of their thought processes.

They were allowed to identify the difficulties they had with the solving of clinical problems. Students acquired a thinking procedure and internalized it through practise.

A definite improvement in their approach and management of clinical problems was apparent.

Students realized the importance of content knowledge as a pre-requisite to effective problem solving. The peer-pair sessions facilitated group interaction and the students displayed an enthusiasm toward the acquisition of new skills.

Students transferred the judgement skills to real life situations by displaying the skills in the clinical units. The latter was illustrated by the co-incidental findings discussed in the previous Chapter.

It has also been suggested by participants that more students be exposed to an intervention program of this nature.

5.3 FURTHER DIRECTIONS FOR RESEARCH.

This type of research should be done on a larger scale. It would also be interesting to do a comparative study with other training facilities in the area.

The researcher suspects that only the tip of the iceberg has surfaced and that more research is required in this regard.

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APPENDIX I.

PROBLEM STATEMENT 1.

1. Mrs E. Smith, a 48 Year old woman in your ward has undergone a gastrectomy.
At 16h00 on the day following her surgery, she complains of lower abdominal discomfort. Explain how you would address this problem.

Attached please find the bedside records of the above-mentioned patient.

STANDAARD WAARNEMINGSKAART

STANDARD OBSERVATION CHART

NAAM / NAME: MRS E SMITH

LÊERNOMMER / FILE NUMBER: 51234567

SAAL / WARD: G10 HOSPITAAL / HOSPITAL: UWC.

DATUM/DATE: 23·4·94 | 24·4·94 | 25·4·94

OST OPERATIEWE DAG / POST OPERATIVE DAY: 0 | 1

TYD/TIME

°C

TEMPERATURE/TEMPERATUUR

40
39
38
37
36

GEWIGHT / LENGTE _____ cm

HEAD CIRCUMFERENCE / KOP OMTREK _____ cm

HARTTEMPO / ASEMHALING / BLOEDDRUK

HEART RATE / RESPIRATION / BLOOD PRESSURE

200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10

Massa/Mass	110kg	
Ontlasting/Stools		
Vomitus		
Dreinering/Drainage		
Innames/Intake		3250
Uitsk/Output		3,000
Hb		
Leukosiete/Leucocytes		
Nitriete/Nitrites		
Bloed/Blood	Neg	
Proteïen/Protein	Neg	
Glukose/Glucose	Neg	
Ketone/Ketones	Neg	
Urobilinogen		
Bilirubien/Bilirubin		
pH	7	
SG		

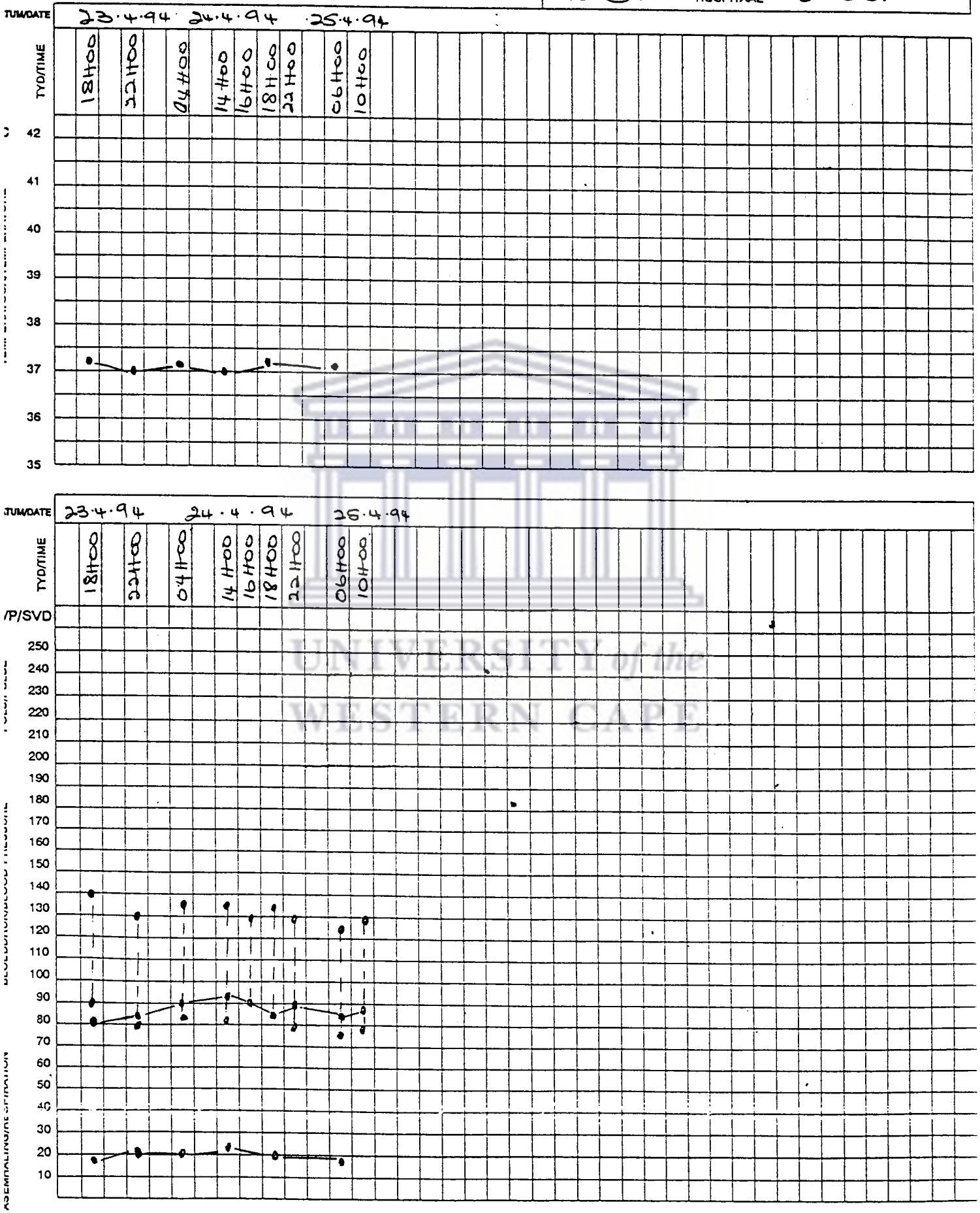
G.P.-S. 020-C055

HOS - 329

SPESIFIEKE WAARNEMINGS KAART

SPECIFIC OBSERVATION CHART

NAAM / NAME	Mrs E Smith
LÊERNOMMER / FOLDER NUMBER	51234567
SAAL / WARD	G10
HOSPITAL / HOSPITAAL	UWC.



* SVP - SENTRALE VENEUSE DRUK
CVP - CENTRAL VENOUS PRESSURE

VOGBALANSERINGSKAART

INSTRUKSIES : MOND/BUISVOEDING

N P M.

DATUM: 25·4·94

VAN EN VOORLETTERS: SMITH E.

LêER NR.: 51234567 GEB. DATUM: 1·1·1946

RAS/GESLAG: F SAAL/AFDELING: G10

INTRAVENEUS INNAME

Instruksies	Druppels per min.	Hand-tekening
1.		
2.		
3.		
4.		
5.		
6.		

Tipe vloeistof	Tyd begin	Tyd voltooi	Volume	Hand tekening
Maintelyte	08h00	15h30	1000ml	SMith SN
Maintelyte	15h30			

TOTAAL INTRAVENEUS:

HANDTEKENING: .....

INNAME 3250 ml UITSKEIDING 3000ml.

Tyd	Mond/Buis Inname	Volume	Voorletters	Tyd	Maagsulging	Vomering	URINE Volume S.G.	Anderdreinering	Stoelgang	Voorletters
08h00	NPM.			08h00						
09h00				09h00						
10h00				10h00			300ml			SMith SN
11h00				11h00						
12h00				12h00						
13h00				13h00						
14h00				14h00						
15h00				15h00						
16h00				16h00						
17h00				17h00						
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23h00				23h00						
24h00				24h00						
01h00				01h00						
02h00				02h00						
03h00				03h00						
04h00				04h00						
05h00				05h00						
06h00				06h00						
07h00				07h00						

TOTAAL MOND/BUIS INNAME: TOTAAL

TOTAAL INNAME ..... TOTAAL UITSKEIDING .....

A

VOORSKRIFKAART - BINNEPASIëNT

13-3

NB - MEDIESE PERSONEEL

1. Hoofletters en goedgekeurde name word gebruik vir artsenymiddels.
2. Wanneer die medikasie gestaak word, trek 'n lyn deur die datumkolom en teken.
3. Handtekening en nommer moet leesbaar wees.

Indien die woorde "OF G.E." (Generiese Ekwivalent) nie deur die voorskrywer geskrap is nie, mag die goedgekeurde ekwivalent uitgereik word.

Naam/Name: Mrs E Smith

51234567 Lêer Nr/Folder No.

Gebore/Born: F. R/G R/S

Saalstempel: G10.

NB - VERPLEEGPERSONEEL

Middel toegedien - parafeer blokkie
Middel nie toegedien nie - dui nommer aan in blokkie en parafeer
1. Pasiënt weg van saal
2. Pasiënt kon middel nie kry nie - bv braking
3. Pasiënt weier middel
4. Middel nie beskikbaar

Geneesmiddel Allergie

DOKTER: Jansen MBChB 0245367 (Handtekening)

Datum	Geneesmiddel of G.E.	Dosis	Frekwensie	Roete	Tydperk	Apteek
24/4	Ampicillin	500mg	6hourly	IVI		
24/4	Flagyl	1g	BD	IVI		
25/4	Panado	··/11	PRN	PO.		

DATUM

Voorgeskrewe tyd	24·4·94 Tyd	24·4·94 Handtekening	25·4·94 Tyd	25·4·94 Handtekening	Tyd	Handtekening	Tyd	Handtekening	Tyd	Handtekening	Tyd	Handtekening	Tyd	Handtekening
			06H00	A Maart										
			12H00	A Maart										
	18H00	K Smith												
	24H00	K Smith												
			06H00	A Maart										
	18H00	K Smit												

B

SAAL: G10

AFDELING: UWC.

TOEGELAAT: 24·4·94

G10.
Saalstempel

NAAM Mrs E Smith	OUDERDOM 48	
LêER NR S1234567	GEBORE 1946	R/G F

Datum	DOKTER SE OPDRAGTE	Handtekening
24/4/94.	① Pain: Pethidine 75mg IMI 4 hourly	
	PRN x 24 hrs ✓22H00 J Smith RN	
	✓10H00 A Maart. RN.	
	✓15H30 A Maart. RN.	
	② Fluid: Maintelyte 1l / 8hrs.	J Jansen
	Strict intake & output.	MB ChB
	③ Observations: Routine post-op.	024567.
	④ Nausea: Stemetil 12,5mg IMI PRN.	
	⑤ NPM.	

PREMEDIKASIE EN EENMALIGE DOSERINGS

Datum	Geneesmiddel	Dosis	Roete	Tyd	Handtekening	Apteek	Tyd toegedien	Handtekening

TH 14B.1
5008824

APPENDIX II.

TRANSCRIPTION AND ANALYSIS OF INTERVIEWS A - D

(The Pre-intervention interviews discussed in Chapter 3.)

Interviews A & B are the "Think-aloud" Interviews, and Interviews C & D are the "In-depth" Interviews.

(L) denotes the verbalization of the student unless otherwise indicated by (S) for student and (I) for interviewer.

INTERVIEW A.

STUDENT [NSA.] READS THE STATEMENT.

L1. The patient has undergone a gastrectomy. So, if she is complaining about the lower abdominal discomfort, the first thing is to ask yourself the possible problems:

L2. Gastrectomy; So, maybe there is bleeding because a foreign object was put into the patients stomach.

L3. So, if there is internal bleeding, that can cause abdominal discomfort. The first step is to check the possible reason.

L4. So, you can palpate the stomach of the patient.If you feel that the stomach is a little bit distended [you can inspect it, it is distended] take the bloodpressure of the patient.

L5. You can also check the medication on which the patient is. After that you can contact his doctor,or her doctor.

L6. So, that is how I would go, to tackle the problem.

L7. Going to the bedside record:

7.1 The temperature of the patient is 37,3°C ,meaning that the temperature is a little bit higher. So, infection may be a possible problem, but, it is not the first thing we can think about because the temperature is not so high.

7.2 We check the bloodpressure. The bloodpressure is 90/20 So, the bloodpressure is not satisfactory, because we said the patient is a 48 year.... 40 year old patient. So, it is not satisfactory. So this patient can go into a state of shock at any time. The normal bloodpressure for this patient maybe: 120/80, 130/70, 110/70 also maybe good but less than 100 is not good.

7.3 The other thing, the mass of the patient is 110 kg.

7.4 The urine test,so, there is nothing I can say about the urine test.

7.5 Intake and output.There is no such a great difference. So, I can say nothing more about these ones on the temperature chart.

7.6 On the bloodpressure chart. It is the same as the temperature one. So, not satisfied about the bloodpressure still. The temperature here is 36.9°C, so there is nothing I can say about it.

7.7 Input and output chart.This patient is receiving Maintelyte 1 Litre,so, even the intake and output chart, and this patient was Nil per mouth. So, even there, there is nothing to say but ,

the urine output is a little bit down because, 1000 mls. went in and only 300 mls was excreted.

That is all from there.

7.8 Prescription. This patient is receiving Ampicillin antibiotics...Ampicillin 500 mg. 6-hourly.

She is also receiving Flaggyl antibiotics...

Flaggyl 1 gm. B.d [twice a day]

And only Panado is received per mouth... 2 tablets

Prn. [when needed]

So, this patient is on antibiotics, why?.. because.... infection may be a problem to her.

And Panado surely for pain ,if there are any pains, slight pain or moderate pain.

7.9 The post-op of this patient was ;

For severe pain, Pethidine 75 mg. imi 4-hourly and it is written if there is pain, and it was only prescribed for 24 hours.And it was given for the 24 hour period. It was given 10 O' clock in the evening and 10 O' clock in the morning.For 12 hours it was given,..and also 14...2 O'clock in the afternoon.So, I can say only one dosage is going to be given now.

Fluid : Maintelyte 1 Litre 8 hourly.

Strict intake and output.

And that Maintelyte may be given because in the first place this patient is receiving antibiotics intravenously and another thing, the patient is also nil per mouth and therefore she is on strict intake and output

Observations , are routine post-op observations...
So as to check any abnormalities and detect them as early as possible,like this one of abdominal discomfort.They can do it 1/4 hourly for 1 hour,Then 1/2 hourly,for 2 hours and after that you do it 4 hourly.

For nausea, Stemetil 12,5mg was written to be given per injection. So, this patient must be held nil per mouth. So, this patient has gone for gastrectomy. It will be impossible for her to be given food immediately after a gastrectomy, because that can cause problems especially vomiting, because of the peristaltic movements which have been disturbed.
So the patient may eat after one day. So that is all I can say about it.

PROTOCOL ANALYSIS.

INPUT PHASE:

The student makes a sweeping perception that the patient has developed internal bleeding [L.2,3] without substantiating it with factual evidence i.e. the patients records are not consulted in this regard.

[S] does not explore the information in a systematic way. He impulsively examines the patients abdomen [L.4] without considering other possible causes of abdominal discomfort.

Cues provided are not scanned and he is unable to select relevant information from them. Consequently, the records of the patient are only dealt with at a later stage [L.7] during the problem-solving process.
Feuerstien [1980, 78] regards this type of behaviour as the product of inadequate training in exploratory skills.

The student does not "explain" how he would address the patients problem but rather proceeds to explain the data obtained from the patient's records. [L.7]

Lack of,or impaired,spatial and temporal orientation:
An inspection of the patients stomach does not reveal that the wound is situated in the upper abdominal area. [L.4] The causes of lower abdominal discomfort could therefore be unrelated to complications of the surgical intervention.

Lack of, or impaired, conservation of constancies.
The fact that the patient weighs 110 kg. does not elicit any response from [S], see [L.7.3].

Lack of, or impaired need for, precision and accuracy.
The student does not obtain all the data before moving to the elaboration phase. He summons medical assistance [L.5.] before consulting the patient records.
He also comes up with a non-existent bloodpressure value [L.7.3], since bloodpressure values are not recorded on that particular chart.

Although the manipulation of the information is done during the elaboration phase, to ensure adequate input, data should be collected from all available sources.

[S] makes use of more than one source, but fails to co-ordinate the information.

He attempts to solve the problem, [L.5 & 6] and then proceeds to explain the data displayed on the patient records. [L.7]

ELABORATION PHASE:

The student is aware of the fact that a problem exists.[L.1] He, however, does not make use of the appropriate information available to him, to define it. [L 2,3]

It is clear that the student lacks purpose in the search for cues. He systematically studies all the available information but does not point out its relevance to the problem: from [L.7.3]one may deduce that the patient is obese; from [L.7.7], that the patient has not passed any urine during the previous six hours.

The student displays comparative behaviour [L.7.7] but does not indicate the relevance of the information obtained in this fashion .He simply states that " the urine output is a little bit down ", but fails to draw the conclusion that the patient may be experiencing urinary retention, or, if still catheterized, that the catheter may be blocked.

The narrowness of the mental field is illustrated by the student's inability to coordinate information. He studies the data independent of each other.[L.7.]

The only summative behaviour displayed by this student is "So that is all I can say" At no stage does he use the clues available to him in a goal directed way in order to explain the symptoms the patient is experiencing.

The student pursues evidence at different levels [L.7] when he tries to explain the patient's vital signs, but does not select relevant cues nor coordinate the available information.

Lack of, or impaired, Interiorization and Planning behaviour.
This type of behaviour is not displayed by the student because of the inadequacy of data assembled during the input phase.
It neither allows him to set specific goals, nor provides him with enough information to predict the outcome of certain actions.

OUTPUT PHASE.

At no stage during the problem solving activity does it appear as if the student experiences a blockage of responses. He proceeds in a relaxed fashion regardless of the validity of the outcome.

Trial-and-error responses

This is illustrated by the decision that the patient is experiencing internal bleeding. [L.3]

At no stage during the interview does it appear as if the student visualizes the patient. As a result of this, there is no transfer of information eg. the fact that the patient has: an intravenous infusion / an urinary catheter in situ; an upper abdominal wound /lower abdominal discomfort etc.

Episodic grasp of reality.

This phenomenon is illustrated throughout the student's problem solving attempt. The concept [Feuerstien 1980] must be understood as being determined by and, at the same time, determining many of the deficient functions.

INTERVIEW B.

STUDENT [NSB.] READS THE STATEMENT

L1. I am first going to look at it step by step:
The woman is 48 years old;
She had a gastrectomy;
And the next day she complains of lower abdominal discomfort.

L2. Firstly, I would ask her how severe are the pains; when did they start ? And I would like to find out exactly what kind of discomfort does she feel...Maybe there has been bleeding.

L3. I would want to do her observations...
Find out her bloodpressure... if it is dropping
Her pulse...if it is increased To see...maybe ..maybe...
rather to prevent the complications of shock.

[At no stage does the respondent consult the bedside records in order to obtain the above mentioned information]

L4. I would check the dressings myself to see if there is any visible bleeding.

L5. I have to report it to the sister in charge.

L6. Make sure she is still nil per mouth.

7L. Look at her in totality ,from her head right down, to see how is her overall condition.

L8. I would see if there is anything written up for pain for her,she could get an injection perhaps if the pain is that severe.

L9. See whether, if she has a drip on, if it is working.

L10. I would go through all her records. And maybe see the reason why she had to have a gastrectomy...what her previous illnesses were..and maybe have an understanding of her history, and get a clearer picture of her condition now.

L11. Maybe her abdominal discomfort may be due to other reasons But I would want to know why ..why is she experiencing the pain..if there is something I can do immediately for her.

[A lengthy silence follows and the student is reminded to "keep on talking"]

L12. I am just picturing an old lady ,very frail....

L13. Put pressure on the wound..Prevention of shock is the main thing

PROTOCOL ANALYSIS.

INPUT PHASE:

Blurred and sweeping perception / Impulsivity.

Initially the student's perception appears to be focused. [L.1,2.] She verbalizes the need for additional information and proceeds to address the problem in an systematic way. However, she does not make use of the patient records in order to obtain the information.

Lack of verbal skills.

She has an excellent command of the language as well as knowledge about subject specific terminology.

Lack of,or impaired,- spatial and temporal orientation /

- conservation of constancies

She orientates herself with regard the time [L.1],but her attempt at visualization fails because of insufficient information [L.12] She describes a 110 kg. woman as being "frail"

Lack of, or impaired - need for precision and accuracy

- use of two sources of information.

The fact that the student did not consult the patient's records, account for both the above-mentioned impairments. She will resultantly also experience problems during the elaboration phase because of her failure to use more than one source of information.

ELABORATION PHASE

Because the data collected during the input phase is inadequate, the student experiences difficulty in defining the problem. All the relevant cues are contained in the records of the patient, ie. answers to her queries. [L.3,6,8,9,11]

She does not, compare, summarize, pursue logical evidence or apply any other elaborative processes, because of the limited information collected during the previous phase.

The confusion and perplexity exists, [L.11] but there is no evidence of goal directed planning behaviour.

OUTPUT PHASE

At this stage the student displays trial- and- error behaviour. She manages the patient's perceived problems symptomatically, [L.8,9,13] while the main complaint is not addressed.

The episodic grasp of reality is clearly illustrated by the student's inability to: gather the relevant data; display comparative or summative behaviour, or formulate a plan of action.

INTERVIEW C.

STUDENT (NSC)

L1 S. Re-reads the statement...

I am now looking to the observations of the patient to see how they might have caused the problem of the patient, how... how... could they have been of effect to the patient's condition.

L2 I. O K.

L3 S. I will first check the pulse... to see if there are any ...is it abnormal .. and thereafter check the blood pressure, because, since the patient has had surgery ,it means that if the bloodpressure is low and pulse high , the patient might be having haemorrhage which is starting to result for complications.

I think I must also check the intake and output of the patient.

L4 I. Why ?

L5 S. To see if the patient has been sufficiently..because after the patient has had gastrectomy the patient is not supposed to eat until..some time .because the patient is not supposed to have anything per mouth.....

then check the fluids of the patient ,if the patient has been properly hydrated.

L6 I. Fine..

L7 S. So, since the patient has been nil per mouth I don't think that the patient has taken anything since nothing has been charted on the patient intake.

Coming to the electrolytes..the patient is not taking anything by mouth so to be properly hydrated the patient must be given 3 litres of fluid.

L8 I. Three litres of fluid ?

L9 S. Yes, 3 litres for 24 hours.So, the patient was given a litre of electrolyte till 17h30 so I think the patient was hydrated properly.

L10 I.Right, is that all on that chart.

L11 S.No, that is not all. again... the urine output of patient..since the patient is experiencing abdominal pain..it might be that the patient is now presenting with urine retention...since the bladder is full.

L12 I.Why are you saying the bladder is full?

L13 S.Well, the patient should after surgery, pass 50 ml. of urine per hour. So, if the patient has passed 300 ml at 10h00.. a difference of 8 and 9 hours.... it does not indicate that the patient has urinary retention.

L14 I.So, you are happy with the fact that the patient has not passed any urine for 8 hours.

L15 S.I cannot say that the patient has not passed any urine for 8 hours because ..I do not know the intake and output of the previous day...then I can say so....But since.

[Subject laughs] " No, I guess now...Yes...I think...now."

L16 I.What do you think now ?

L17 S.The patient has not passed urine for..[subject counts] 1.2.3.4.5..For 5 hours, because if I look to the electrolyte chart, the last time the reading was charted on the intake and output,... nothing has been charted from 10'o Clock, which means that for that period the patient has not passed urine...

So it means that the patient is now presenting with a full bladder.So that might be the cause of the abdominal pain.

And again I think I must check the prescription of the patient.

L18 I. Why?

L19 S.I cannot relate it to the abdominal pain but I think I must also...since the patient's stomach has been removed the patient can develop anaemia ...so I must see which medication has been prescribed as supplement.

So I must also look at the position my patient is lying

L20 I. Why?

L21 S.Because if the patient lying on the area where the operation has been.....it can cause pain.

I must also check whether the patient's position has been changed...Since the patient is old....and put her in a comfortable position.

L22 I.So you are saying...change the position. What about the other problem that you have identified?

L23 S.To check if the patient has a catheter.... to check if there is a flow of urine. If not ..a catheter must be inserted for the patient.

PROTOCOL ANALYSIS

Content.

The [S] knows the content of the material. He realizes that he should draw information form various fields in order to solve the problem. [L.15 & 19] What is also tested is the application of theoretical knowledge [LTM.] in the solving of a clinical problem. [L.9 & 19]

Operations.

Problem-solving behaviour is tested. The student is able to analyze, [L.5] compare, [L.9] and make inferences [L.11] thus illustrating his ability to utilize a number of operations in order to gain insight into the problem.

Modality.

A mental act may be expressed in a variety of languages. [Feuerstein, 1980] In this instance it includes a combination of; numerical, graphic, verbal as well as the written modality.
The [S] does not show a preference for any one of the above, but strikes an acceptable balance between all of them.

Phase.

What is important to note from this transcript is the distinct interplay between the different phases [Input, elaboration & output]. The [S] appears to have divided the problem into smaller components and then apply the problem-solving technique to each of these.

He identifies three post-operative complications ie: haemorrhage [L.3], fluid imbalance [L.5-17], and the patient's position [L.21], as probable causes of the patient's abdominal discomfort.

Haemorrhage is eliminated as a possible cause of the patient's problem because [S] cannot find enough data to substantiate it [L.3].
He spends most of his time exploring the second option.
His [LTM.] about fluid balance is accurate [L.5.7& 9], but the data that he collects is incorrect [L.13] thus creating difficulties for him during the elaboration phase.
It is only when the [S] is challenged about the data [L.14] that he corrects himself [L.15].

He also continues to collect irrelevant information [L.19] from the prescription chart.

However the [S] biggest problem lies in the fact that he does not proceed to the output phase. He collects data from various sources, manipulates it and identifies problems, but does not proceed to address them [See problem statement]
He identifies the patient's position as one of the probable causes of the discomfort and suggests that her position be changed.
However, it is only after a probe from the [L.22] that he considers addressing the other problem [L.23] as he refrained from doing so earlier.[L.17.]

It is therefore important to locate the source of the inadequate response in order to offer mediation to the [S]
[Feuerstein, 1980]

Level of complexity

This particular problem-solving attempt proves Feuerstien's view that if the units are familiar, the mental act is less complex, even if the units are multiple.[1980]
Because the content was familiar to him, the [S] could readily apply cognitive skills in order to illustrate his problem-solving abilities.

Level of abstraction

The problem statement is fairly abstract in the sense that the [S] has to extract information from the relationship between the available data.

Level of efficiency

In this instance efficiency does not only refer to the speed or accuracy of the process but also implies the level of automatization of the response. The level of efficiency displayed by this [S] may be described as average, because when he compares values, he consciously relays all the data to "normal " values [L.9&13]

INTERVIEW D

STUDENT (NSD)

L1 S. Re-reads statement.

Because she has an opening on the abdominal cavity,... linking the opening to the temperature of the patient...the temperature is above normal.

L2 I. What is normal ?

L3 S. Maximum 37.2°C. The previous day it was 37.3°C...Now it went up to 37.3°C...37.4°C.

L4 I. O.K.

L5 S. The complaint is lower abdominal discomfort..but the discomfort doesn't tell whether is it due to pain or...but now here the temperature is normal again, here it is 37°C ..So there is no possibility of maybe infection. So the infection is out now at this point.

L6 I. Right,... please continue.

L7 S. There might be bleeding..But the information that there is bleeding maybe..The signs on the skin..

L8 I. Are the signs on the skin the only signs?

L9 S. Not actually the only signs..the bloodpressure..But here the bloodpressure is within normal ranges due to the age of the patient.

L10 I.O.K, so what does that mean?

L11 S.That bleeding is not a possibility..Because even the pulse,... because she is a woman,..it is within normal ranges ...So bleeding and infection ....there is not a possibility.

[A long pause follows and the subject glances at the observation chart]

L12 I.What are you looking at?

L13 S.I was looking at the age..I was trying to keep my mind consistent with the information.I do not want to loose the information

L14 I.Okay.

L15 S.Okay..the intake and output..The patient had 1000 ml. of Maintelyte, 8'o Clock ....there is no date so I assume that it is today.

L16 I.Right

L17 S.She excreted 300 ml..So there might be a slight possibility of, maybe....maybe the bladder is full..urinary retention.

L18 I.Why do you say that..that it might be?

L19 S.Because,She must excrete 1000ml if she is taking in 1000ml. Yes, I would look on the possibility of urinary retention.

[Once more the student pages through the charts]

L20 I.What are you looking for now?

L21 S.I am looking for the medication..what kind of medication did the doctor prescribe...Because the discomfort may be due to pain..So the doctor has prescribed 75 mg. Pethidine.So let's assume that Pethidine has been given at 3'o Clock.....an hour before the discomfort, according to this prescription .....So pain is also out.

L22 I.So, what are you left with?

L24 S.I'm still left with urinary retention.

So, I look at the possibility of urinary catheterization.

L25 I.Would that be your first priority?

L26 S.Yes. That is ..one. Secondly ,maybe the patient is lying incorrectly.

L27 I. What do you mean by incorrectly.

L28 S.She must not lie on her side... She must lie on her back and the blankets must not be tucked in too tightly... Then the surgery..she may develop intestinal obstruction..

L29 I.So, how would you prioritize your solutions.

L30 S.I will start with the patients position. From there if the patient still complains I would try the catheter.

PROTOCOL ANALYSIS.

Content

Once again the content is not new to the [S]. It is expected of him to apply theoretical knowledge [LTM] in order to solve a clinical problem. He also has to draw on his practical experience in order to address the patient's needs.

This is clearly illustrated by the statement [L.13]

Operations

A variety of operations are displayed by the [S] during the problem-solving exercise. He has to compare data [L.5], analyze information [L.9] and critically analyze his findings [L.11].

Modality.

The task is presented in a number of different modalities ie. numerical, graphic and written format. The [S] however does not indicate a preference for a specific one of the above, but employs a combination of all of them.

Phase.

The problem-solving behaviour displayed by the [S] is structured and goal oriented. However,he focuses so much on the problem, that he does not systematically consider all the givens.

During the input phase, his attempts at visualization is confined to the age of the patient [L.13] He looses sight of the fact that he is dealing with an obese patient and that the discomfort is not located at the site of the wound. The latter indicates a possible problem with spatial orientation.

The [S] however, clearly displays his ability to make use of more than one source of information [L.13&21].

During the elaboration phase the [S] also illustrates comparative behaviour [L.5], the need for logical evidence [L.15-17] and strategies for hypothesis testing [L.7-11].

Once again the student collects data, manipulates it but does not follow through to the output phase, namely to address the patient's abdominal discomfort. He [S] assumes that to identify the problem is sufficient [L.19] and needs a probe in order to communicate his intervention strategy. [L.22&25]

The level of complexity.

Although different modalities were employed in the problem statement, the subject did not display any difficulty in addressing the patient's discomfort. He [S] managed to manipulate the data because the content was familiar to him.

The level of abstraction.

The problem statement is fairly abstract because it forces the [S] to draw inferences about the relationship between various givens.

The level of efficiency.

The [S] displays efficient behaviour because of the manner, pace, accuracy and goal directed way that in which he identifies the patient's problems.

APPENDIX III.

PROBLEM STATEMENT 3A.

Mrs E. Smith a 20 year old woman in your ward has undergone an appendicectomy.
At 15h00 on the day following her surgery, she complains of a non specific " tightness " in her chest and produces frothy white sputum.

Explain how you would address the patient's problem.

Attached please find the bedside records of the above-mentioned patient.

STANDAARD WAARNEMINGSKAART

STANDARD OBSERVATION CHART

NAAM NAME	Miss E Smith
LÊERNOMMER FILE NUMBER	51234567
SAAL WARD	G10
HOSPITAAL HOSPITAL	UWC.

DATUM/DATE: 20/9/94 | 21/9/94 | 22/9/94

OST OPERATIEWE DAG / POST OPERATIVE DAY: @ | 1

TYD/TIME: 8h00 | 14h00 | 8h00 | 14h00 | 8h00 | 14h00 | 8h00 | 14h00 | 8h00 | 14h00 | 8h00 | 14h00 | 8h00 | 14h00 | 8h00 | 14h00 | 8h00 | 14h00

°C

TEMPERATURE/TEMPERATUUR

40
39
38
37
36

HEIGHT / LENGTE _____ cm

HEAD CIRCUMFERENCE / KOP OMTREK _____ cm

HARTTEMPO / ASEMHALING / BLOEDDRUK

HEART RATE / RESPIRATION / BLOOD PRESSURE

200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10

Massa/Mass	42kg																
Ontlasting/Stools																	
Vomitus																	
Dreinering/Drainage																	
Inname/Intake		3,250															
Uitsk/Output		3,000															
Hb	12g/dl																
Leukosiete/Leucocytes																	
Nitriete/Nitrites																	
Bloed/Blood	Neg																
Proteïen/Protein	Neg																
Glukose/Glucose	Neg																
Ketone/Ketones	Neg																
Urobilinogen																	
Silirubien/Bilirubin																	
pH	7																
SG																	

SPESIFIEKE WAARNEMINGS KAART

SPECIFIC OBSERVATION CHART

NAAM NAME	Miss E Smith.
LÊERNOMMER FOLDER NUMBER	51234567
SAAL WARD	G10 HOSPITAL HOSPITAAL UWC.

DATUM/DATE 20.9.94 21.9.94 22/9/94

TYD/TIME 18H00 05H00 14H00 18H00 06H00

°C

TEMPERATUUR/TEMPERATURE

42 41 40 39 38 37 36 35

DATUM/DATE 20/9/94 21/9/94 22/9/94

TYD/TIME 18H00 05H00 14H00 16H00 18H00 22H00 02H00 06H00 10H00 14H00

VP/SVD

POLS/PULSE

BLOEDDRUK/BLOOD PRESSURE

ASEMHALING/RESPIRATION

250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10

* SVP - SENTRALE VENEUSE DRUK
CVP - CENTRAL VENOUS PRESSURE

VOGBALANSERINGSKAART

INSTRUKSIES : MOND/BUISVOEDING

NPM.

DATUM: 22/9/94

VAN EN VOORLETTERS: SMITH E.

LêER NR. 5123456 GEB. DATUM: 1974

RAS/GESLAG: F SAAL/AFDELING: Gyn

INTRAVENEUS INNAME

Instruksies	Druppels per min.	Hand-tekening
1.		
2.		
3.		
4.		
5.		
6.		

Tipe vloei-stof	Tyd begin	Tyd voltooi	Vo-lume	Hand tekening
Maintelyte	Night Staff	08h00	500ml	A Maart
Maintelyte	08h00	10h05	1000ml	A Maart
Maintelyte	10h05.	12h15	1000ml	S Abel
Maintelyte	12h15	14h00	1000ml	S Abel
Maintelyte	14h00			

TOTAAL INTRAVENEUS:

HANDTEKENING: .....

INNAME 3,250 ml. UITSKEIDING 3000ml

Tyd	Mond/Buis Inname	Volume	Voor-letters	Tyd	Maag-suiging	Vome-ring	URINE Volume S.G.	Ander Drein-ering	Stoel-gang	Voor-letters
08h00	NPM			08h00			400ml			A Maart
09h00				09h00						
10h00				10h00						
11h00				11h00						
12h00				12h00			600ml			S Abel
13h00				13h00						
14h00				14h00			500ml			S Abel
15h00				15h00						
16h00				16h00						
17h00				17h00						
18h00				18h00						
19h00				19h00						
20h00				20h00						
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01h00				01h00						
02h00				02h00						
03h00				03h00						
04h00				04h00						
05h00				05h00						
06h00				06h00						
07h00				07h00						

TOTAAL MOND/BUIS INNAME: TOTAAL

TOTAAL INNAME ..... TOTAAL UITSKEIDING .....

B

SAAL: G10
AFDELING: UWC.
TOEGELAAT: 20/9/94.

G10
Saalstempel

NAAM Miss E. Smith OUDERDOM 20
LêER NR S1234567 GEBORE 1974 R/G F.

Datum	DOKTER SE OPDRAGTE	Handtekening
21/9/94	Post-op.	
	① Pain: Pethidine 50mg IMI 4hourly	
	PRN x24 hrs. 22H00 [illegible]	
	08H00 [illegible]	
	14H00 [illegible]	
	② Fluid: Maintelyte 1L / 6 hours	
	Strict intake + output.	[illegible] 042340.
	③ Observations: Routine post-op	
	④ Nausea: Stemetil 12,5mg IMI	
	PRN.	
	⑤ NPM.	

PREMEDIKASIE EN EENMALIGE DOSERINGS

Datum	Geneesmiddel	Dosis	Roete	Tyd	Handtekening	Apteek	Tyd toegedien	Handtekening

TH 14B.1
5008824

STANDAARD WAARNEMINGSKAART

STANDARD OBSERVATION CHART

NAAM NAME	Mrs E Smith
LÊERNOMMER FILE NUMBER	51234567
SAAL WARD	G9
HOSPITAAL HOSPITAL	UWC.

DATUM/DATE: 31/8/94 | 1/9/94

POST OPERATIEWE DAG / POST OPERATIVE DAY

TYD/TIME: 6h00 | 10h00 | 14h00 | 18h00 | 22h00 | 02h00 | 06h00 | 10h00 | 14h00 | 18h00 | 22h00 | 02h00 | 06h00 | 10h00 | 14h00 | 18h00 | 22h00

°C

TEMPERATURE/TEMPERATUUR: 40 | 39 | 38 | 37 | 36

HEIGHT / LENGTE: _____ cm

HEAD CIRCUMFERENCE / KOP OMTREK: _____ cm

HARTTEMPO ASEMHALING BLOEDDRUK / HEART RATE RESPIRATION BLOOD PRESSURE: 200 | 190 | 180 | 170 | 160 | 150 | 140 | 130 | 120 | 110 | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10

BAL.		
	Massa/Mass	60kg.
	Ontlasting/Stools	
	Vomitus	
	Dreinering/Drainage	
	Inname/Intake	
	Uitsk/Output	
	Hb	
	Leukosiete/Leucocytes	
	Nitriete/Nitrites	
	Bloed/Blood	Neg
	Proteïen/Protein	Neg
	Glukose/Glucose	
	Ketone/Ketones	
	Urobilinogen	+
	Bilirubien/Bilirubin	+++
	pH	
	SG	

SPESIFIEKE WAARNEMINGS KAART

SPECIFIC OBSERVATION CHART

NAAM NAME	MRS E SMITH
LÊERNOMMER FOLDER NUMBER	5123456?
SAAL WARD	G10
HOSPITAL HOSPITAAL	UWC.

DATUM/DATE 31/8/94 1/9/94

TYD/TIME: 18H00 | 06H00 | 10H30 | 10H45 | 11H00 | 11H45 | 12H00 | 14H00

TEMPERATUUR/TEMPERATURE °C: 42 41 40 39 38 37 36 35

DATUM/DATE 31/8/94 1/9/94

TYD/TIME: 18H00 | 06H00 | 10H30 | 10H45 | 11H00 | 11H45 | 12H00 | 14H00

CVP/SVD

POLS/PULSE: 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10

BLOEDDRUK/BLOOD PRESSURE

ASEMHALING/RESPIRATION

* SVP - SENTRALE VENEUSE DRUK
CVP - CENTRAL VENOUS PRESSURE

A

VOORSKRIFKAART - BINNEPASIëNT

13-3

NB - MEDIESE PERSONEEL

1. Hoofletters en goedgekeurde name word gebruik vir artsenymiddels.
2. Wanneer die medikasie gestaak word, trek 'n lyn deur die datumkolom en teken.
3. Handtekening en nommer moet leesbaar wees.

Indien die woorde "OF G.E." (Generiese Ekwivalent) nie deur die voorskrywer geskrap is nie, mag die goedgekeurde ekwivalent uitgereik word.

Naam/Name Mrs E Smith.

51234567 Lêer Nr/Folder No.

1969 Gebore Born F R/G R/S

G9

Saalstempel

NB - VERPLEEGPERSONEEL

Middel toegedien - parafeer blokkie

Middel nie toegedien nie - dui nommer aan in blokkie en parafeer

1. Pasiënt weg van saal
2. Pasiënt kon middel nie kry nie - bv braking
3. Pasiënt weier middel
4. Middel nie beskikbaar

Geneesmiddel Allergie

DOKTER				
DATUM	GENEESMIDDEL OF G.E.			HANDTEKENING
DOSIS		FREKWENSIE		
ROETE	TYDPERK	APTEEK		

DOKTER				
DATUM	GENEESMIDDEL OF G.E.			HANDTEKENING
DOSIS		FREKWENSIE		
ROETE	TYDPERK	APTEEK		

DOKTER				
DATUM	GENEESMIDDEL OF G.E.			HANDTEKENING
DOSIS		FREKWENSIE		
ROETE	TYDPERK	APTEEK		

DOKTER				
DATUM	GENEESMIDDEL OF G.E.			HANDTEKENING
DOSIS		FREKWENSIE		
ROETE	TYDPERK	APTEEK		

DOKTER				
DATUM	GENEESMIDDEL OF G.E.			HANDTEKENING
DOSIS		FREKWENSIE		
ROETE	TYDPERK	APTEEK		

DATUM

Voorgeskrewe tyd	Tyd	Handtekening	Tyd	Handtekening	Tyd	Handtekening	Tyd	Handtekening	Tyd	Handtekening	Tyd	Handtekening	Tyd	Handtekening

STANDAARD WAARNEMINGSKAART

STANDARD OBSERVATION CHART

NAAM / NAME: Mrs E. Smith.

LÊERNOMMER / FILE NUMBER: 51234567

SAAL / WARD: G2 HOSPITAAL / HOSPITAL: UWC.

DATUM/DATE	15/10/94	16/10/94	17/10/94	18/10/94	19/10/94									
OST OPERATIEWE DAG / POST OPERATIVE DAY		0	1	2	3									
TYD/TIME	8h00 / 17h00	8h00 / 17h00	8h00 / 17h00	8h00 / 17h00	8h00 / 17h00	8h00 / 17h00	8h00 / 17h00	8h00 / 17h00	8h00 / 17h00	8h00 / 17h00	8h00 / 17h00	8h00 / 17h00	8h00 / 17h00	8h00 / 17h00
°C														
TEMPERATURE/TEMPERATUUR 40														
39														
38														
HEIGHT / LENGTE — cm 37														
HEAD CIRCUMFERENCE / KOP OMTREK — cm 36														
200														
190														
180														
170														
160														
150														
140														
130														
120														
110														
HARTTEMPO / ASEMHALING / BLOEDDRUK 100														
90														
80														
HEART RATE / RESPIRATION / BLOOD PRESSURE 70														
60														
50														
40														
30														
20														
10														
Massa/Mass	100kg													
Ontlasting/Stools	x1			x1										
Vomitus														
Dreinering/Drainage														
BAL Inname/Intake		3500	3800											
Uitsk/Output		3,200	3,500											
Hb														
Leukosiete/Leucocytes														
Nitriete/Nitrites														
Bloed/Blood	Neg													
Proteïen/Protein	Neg													
Glukose/Glucose	Neg													
Ketone/Ketones	Neg													
Urobilinogen														
Bilirubien/Bilirubin														
pH	5													
SG														

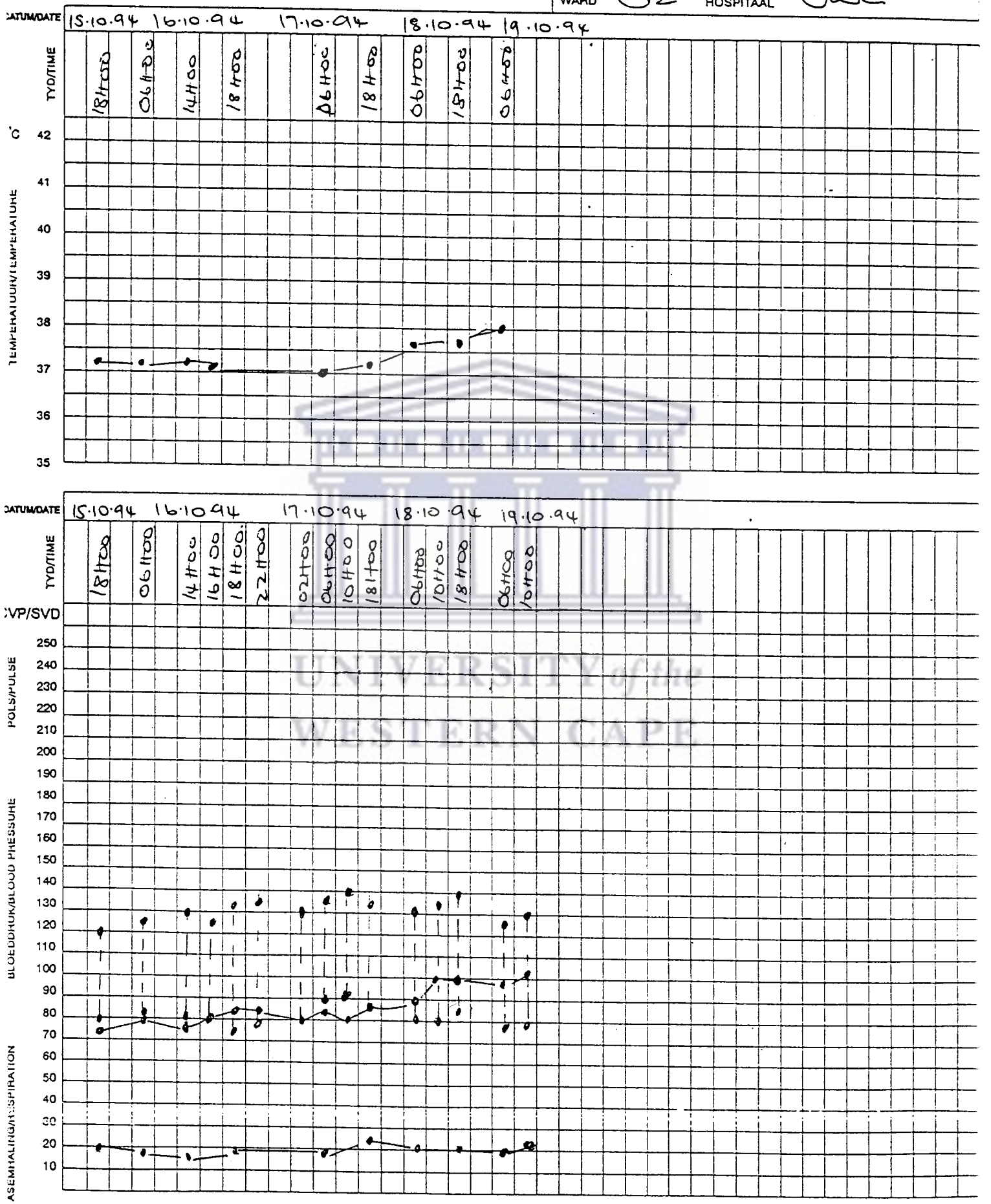
G.P.-S. 080-0055

HOS - 22.

SPESIFIEKE WAARNEMINGS KAART

SPECIFIC OBSERVATION CHART

NAAM NAME	MRS E. SMITH
LÊERNOMMER FOLDER NUMBER	51236567
SAAL WARD	G2
HOSPITAL HOSPITAAL	UWC



* SVP - SENTRALE VENEUSE DRUK
CVP - CENTRAL VENOUS PRESSURE

VOGBALANSERINGSKAART
INSTRUKSIES : MOND/BUISVOEDING

Fluid diet.

DATUM: 19/10/94
VAN EN VOORLETTERS: Smith
LêER NR.: S1234567 GEB. DATUM: 1938.
RAS/GESLAG: F SAAL/AFDELING: G2.

INTRAVENEUS INNAME

Instruksies	Druppels per min.	Handtekening
1.		
2.		
3.		
4.		
5.		
6.		

Tipe vloeistof	Tyd begin	Tyd voltooi	Volume	Handtekening
Maintelyte	Night staff	08H00	200ml	B Maat
Maintelyte	08H00			

TOTAAL INTRAVENEUS:

HANDTEKENING: ....

INNAME 3800ml. / UITSKEIDING 3500ml

Tyd	Mond/Buis Inname	Volume	Voorletters	Tyd	Maagsuiging	Vomering	URINE Volume S.G.	Ander Dreinering	Stoelgang	Voorletters
08h00	Water	150ml.	S Maat	08h00			100ml.			S Maat.
09h00	Breakfast	200ml.	S Maat	09h00						
10h00				10h00						
11h00				11h00						
12h00				12h00						
13h00				13h00						
14h00				14h00						
15h00				15h00						
16h00				16h00						
17h00				17h00						
18h00				18h00						
19h00				19h00						
20h00				20h00						
21h00				21h00						
22h00				22h00						
23h00				23h00						
24h00				24h00						
01h00				01h00						
02h00				02h00						
03h00				03h00						
04h00				04h00						
05h00				05h00						
06h00				06h00						
07h00				07h00						

TOTAAL MOND/BUIS INNAME: TOTAAL

TOTAAL INNAME .... TOTAAL UITSKEIDING ....

A

13-3

VOORSKRIFKAART - BINNEPASIëNT

NB - MEDIESE PERSONEEL

1. Hoofletters en goedgekeurde name word gebruik vir artsenymiddels.
2. Wanneer die medikasie gestaak word, trek 'n lyn deur die datumkolom en teken.
3. Handtekening en nommer moet leesbaar wees.

Indien die woorde "OF G.E." (Generiese Ekwivalent) nie deur die voorskrywer geskrap is nie, mag die goedgekeurde ekwivalent uitgereik word.

Naam/Name MRS E SMITH

51234567 Lêer Nr/Folder No.

1938 Gebore/Born F R/G R/S

G2 Saalstempel

NB - VERPLEEGPERSONEEL

Middel toegedien - parafeer blokkie

Middel nie toegedien nie - dui nommer aan in blokkie en parafeer

1. Pasiënt weg van saal
2. Pasiënt kon middel nie kry nie - bv braking
3. Pasiënt weier middel
4. Middel nie beskikbaar

Geneesmiddel Allergie

DATUM

DOKTER

Voorgeskrewe tyd	16/10/94 Tyd	16/10/94 Handtekening	17/10/94 Tyd	17/10/94 Handtekening	18/10/94 Tyd	18/10/94 Handtekening	19/10/94 Tyd	19/10/94 Handtekening	Tyd	Handtekening	Tyd	Handtekening	Tyd	Handtekening
			06Hrs	A Allen R	06Hrs	A Allen R	06Hrs	A Allen R						
			12Hrs	B Maart R	12Hrs	B Maart R								
	18Hrs	S Maart R	18Hrs	B Maart R	18Hrs	B Maart R								
	24Hrs	A Allen R	24Hrs	A Allen	24Hrs									
			06Hrs	A Allen R	06Hrs	A Allen R	06Hrs	A Allen R						
			14Hrs	B Maart R	14Hrs	B Maart R								
	22Hrs	A Allen R	22Hrs	A Allen R	22Hrs	A Allen R								
					18Hrs	B Maart R								

DATUM	GENEESMIDDEL OF G.E.	DOSIS	FREKWENSIE	ROETE	TYDPERK	APTEEK	HANDTEKENING
16/10	Fimpicillin	500mg	6hourly	IVI			
16/10	Flagyl	400mg	8hourly	IVI			
17/10	Panado	1/11 tabs	6hrly PRN.	P/o			

SAAL: G2
AFDELING: UWC.
TOEGELAAT: 15.10.94

G2.
Saalstempel

NAAM Mrs E Smith OUDERDOM 56
LêER NR 51234567 GEBORE 1938 R/G F

Datum	DOKTER SE OPDRAGTE	Handtekening
16/10/94	Postop.	
	① Pain: Pethidine 75mg IMI 4hourly	
	PRN x 24hrs ✓22H00 A Allen R. ✓08H00 B Mart RN.	
	✓13H00 B Mart RN.	
	✓24H00 A Allen RN.	
	② Fluid: Maintelyte 1l/8hrs.	P. Smith.
	Strict intake and output	042345.
	③ Observations: Routine post-op obs.	
	④ Stemetil 12,5mg IMI PRN for Nausea	
	⑤ NPM	
17/10/94	Mobilize patient	
	Remove urinary catheter.	P. Smith.
	Sips of water.	042345
18/10/94	Apply clean dressing.	A Anthony
	Fluid diet.	02345

PREMEDIKASIE EN EENMALIGE DOSERINGS

Datum	Geneesmiddel	Dosis	Roete	Tyd	Handtekening	Apteek	Tyd toege-dien	Hand-tekening

TH 14B.1
5008824

DEURLOPENDE VERSLAG/ CONTINUOUS REPORT

MRS E SMITH 56yrs
5123456 7 1.1.1938

AFDELING: G2
DEPARTMENT: UWC

DRESSING RECORD

DATUM DATE	TYD TIME	VERSLAG / REPORT	HANDTEKENING + RANG SIGNATURE + RANK
D1.	10H00	Minimal oozing observed	
17/10/94		on the dressing	A Allan Dr
D2.	11H00	Wound cleaned with Povidone	
18/10/94		Iodine 1:10 in sterile water	
		Clips and sutures in-situ	
		Clean dressing applied	
		Minimal yellow discharge	B Mentz sr
		observed from red area	
		near the distal end of	
		the wound	
D3			
19/10/94			

APPENDIX V

TRANSCRIPTION AND ANALYSIS OF INTERVIEWS 1 - 6

(The Post-intervention interviews discussed in Chapter 4.)

(L) denotes the verbalization of the student unless otherwise indicated by (S) for student and (I) for interviewer.

INTERVIEW 1.

STUDENT (NS1) re-reads problem statement.

L1. I am just checking the dressing record. When I was dressing the wound I saw that there was a purulent discharge.... discharging sinus near the distal end of the wound.

L2. Now I am just going to look in the records to see when was this operation done.
It was done about four days ago, no .... three days ago and.....

L3 and on the wound record.....
On day one, there was minimal discharge on the dressing, but it does not say what it looked like.
On day two..... (Reads report)
And on the third day the sinus has developed, and there is a yellow discharge...

L4. So then, I am going to the records of the patient's:
Temperature: started to rise from the third day to 38°C, and the pulse rate is also increased, and it is about 104

on the third day. The bloodpressure has been constant at 125/85. Let me see, on what medication the patient is.

L5. The.... prescription reads as follows ...(Subjects reads prescription chart and checks whether the prescribed medication was administered).
Concludes that, " antibiotics was given as prescribed, however, the Panado was not given."

L6. Well..... I notice that she is still having Maintelyte intravenously and fluids per mouth

L7. I am looking at this record (points to observation chart) Here the temperature seems to be increasing all the time .... it is increasing from the second day and the pulse is also increased to 104, So.....

L8 I think the first thing I'll do is to : clean the patient's wound, in this case it seems as if there is purulent discharges.
I will clean the wound three times a day and keep a record to see what type of discharges is still coming out of the wound, and to see if there is any progress or deterioration in the condition of the wound.

L9. I. Will you just clean the wound?
S. Yes, I will clean it, apply ointment or contact the doctor for a prescription for what type of ointment to use.... you can use Betadine.

L10. So if the temperature keeps increasing it may be a sign that there is infection in the wound, and from the dressing record you see that there has been yellow discharges from the second day.

L11.I think what I must also do is to take a swab of the wound in order to see what type of micro organisms are there, seeing that the patient is on systemic antibiotics from the first day.... maybe the antibiotics are not adequate enough.....

L12.And the other thing, I have to do is to decrease the temperature of the patient... prevent it from rising. Panado can help with that.

And a tepid sponge, I can say.... How often can I do that?

L13. I. How often can you do what?

S. Ok, I think I will do it once and apply maybe a fan to cool the background.

L14.The observations ... The bloodpressure looks Ok. I think I'll do it four-hourly.

L15. I. What are you looking at now?

S. I am looking at the intake and output chart and also looking at the fact that my patient is weighing 100kg.

L16. I. What does that tell you?

S. It tells me that my patient is somehow overweight. and so if the patient is overweight that can obviously be a problem.... taking into consideration that this has been an abdominal operation and that means that it will take a time for the wound to heal.

L17. I. Do you think that has any implications re. your intervention?

S. Yes, well, the thing with these obese people is that there is a ..... looking at the wound, that is the

incision in the abdomen..... and the blood supply to the area is not so good and the.....

L18. I. Is there anything that you can do about this. Apart from what you have mentioned already?

S. Well, one of my interventions would be health education of the patient because obesity may lead to delay in wound healing and there may be other problems.

L19. So the patient must eat food that will help with the healing of the wound, in this case proteins.

L20. Let's see.... the age, but is not... of any relevance here. I think that is all.

PROTOCOL ANALYSIS.

Content.

The (S) knows the content of the material. He looks for specific information to substantiate his assumptions (L10), and logically plans to address the problem of wound healing (L8). However, he neglects to suggest a change in the patient's wound care, based on practical experience (L.12)

Operations.

Decision making behaviour is displayed by this (S). He identifies the givens and draws conclusions about them. (L2,3,4,,&5). He spells out the relationships between the givens (L10) and proceeds to plan the appropriate interventions.

Modality.

The respondent does not indicate any preference for a specific modality. He employs a combination of written, numeric, and graphic formats.

Phase.

The (S) shows a mastering of the cognitive operations required during the input phase. What he performs exceptionally well, is the spontaneous use of spacial/time referents (L2,3,4).

He however, fails to establish that the patient is obese(100 Kg).

There is also a distinctive interplay between the input and elaboration phase.

The (S) defines the problem (L10) and then systematically plans his intervention around the signs and symptoms of wound infection. However, the one sub-problem (wound dressing technique) that relies on knowledge about practical experience is not adequately addressed. At third year level the (S) should know to act as a patient advocate in order to initiate wound irrigation. The response at the output level lacks this important factor.

Level of complexity, abstraction, and efficiency.

The (S) managed to manipulate the data easily because the content was familiar to him.

The problem statement is fairly abstract because the (S) has to draw inferences about the relationship between a variety of givens.

He displays efficient behaviour because of the pace, accuracy and goal directed way in which he addressed the patient's problem.

INTERVIEW 2.

STUDENT (NS2) Re-reads problem statement aloud.

L1. S. I am looking at the temperature and respiration " the vital signs" chart.

I. Why?

L2 S. First let me explain.

We've got a woman who's had a total abdominal hysterectomy and bilateral salpingo oophorectomy, and this was done after post menopausal haemorrhage.

H'm... she's got no history of any chronic disease. H'm... This under wound care.....

Presently she is having purulent discharge.... discharging sinus at the distal end of the wound. And there is no other post-operative complications.

L3. Because there is no other post-operative complications, I am looking at the charts to see what can the cause be of that purulent discharge. Because there is no other evidence.....

L4. I. No other evidence of what?

S. No other evidence of post-operative complications. So.... I am looking at the chart to gather more evidence.

L5. Firstly, I would like to find out when was the operation done because the 29th which is to-day.... the patients temperature is high.

L6. I. So how are you going to find out when the operation was done.

S. H'm.... I'll look at the prescription chart those post-operative..... was on the 26th. So the operation was done on the 26th, and today is the 29th. So.....on the 27th the observations were normal.

L7. S. The patient is weighing 100 Kg!

I. What does that tell you?

S. She's fat (laughs), she is two times my size, and she is ..... I am looking at the age.... she's 56 years.

L8. Now, because the temperature is very high, and the pulse rate is also high... I'm looking at the bloodpressure.... the bloodpressure is within normal ranges. So.... I'm excluding things like bleeding because the bloodpressure does not give us evidence of it.

(S. looks at other charts).

L9. I. What are you looking at now?

S. I'm looking at the solution used for cleaning the wound. So it says "clean dressing".

L10. I. What does that imply?

S. The implications is that there's nothing like an ointment that's applied on the dressing. It's just the standard solution.

L11. I. What is the standard solution?

S. It is Povidone 10mls mixed with 100 mls of sterile water, that is the standard solution.

L12. And the intravenous ... the fluid intake.. the patient is getting Maintelyte 200 mls, and she has excreted 100mls after taking 250ml of oral fluid from 08h00.

L13. Because I don't find any other information regards other postoperative complications, but the temperature which is very high, signifying, maybe infection ....because there is a purulent discharging sinus that needs intervention.

L14. The pulse rate being very high, has many implications.... maybe the body is trying to supply more blood to the affected area, or the woman is anxious because there's oozing on her wound. But I'm still left with infection.

L15. Just let me look at the prescription chart at the medication. She's on Ampicillin and Flagyl. H'm.. These were prescribed on the 26th and on the 26th there was no infection, but on the 29th there are signs of infection. Now, intervening here, because the patient is fat, I regard this case as post-operative infection.

L16. It boils to the point of maybe, how did the infection come there? Is it because of poor dressing.....poor wound care? or maybe intra-operative infection, so to try and bring this temperature down so.....

L17. I will, firstly, I will encourage the patient to take in more fluids to regulate the temperature.
The patient must rest because it diminishes the metabolic activity.

L18. I. What do mean by rest?
S. She must not just lie in the bed but she must not do any strenuous exercises, because I can see that it is prescribed..... Mobilize the patient.

The person's who mobilize the patient's are the physiotherapists and they do not look at the wound so that can be one of the factors.

So the patient must rest to decrease the metabolic demand.

L19. I. So you are saying: push fluids, rest....Is there anything else?

S. And because the patient is very fat the positioning of the patient. She can be positioned on the lateral side in order to enhance that discharge.

L20. S. And the doctor has prescribed only "Clean dressing" I'd change it to,... irrigate the wound.

I. Will you change it?

L21. No, I will not change it but I'll bring it to the attention of the doctor. At least the wound must be irrigated, and something like an ointment must be put on the wound... it must act locally.

The rest of the antibiotic is systemic.

L22. S. I can see the patient has had a fluid diet. I'll try for the patient to get semi-solid diet because it has more of a nutritional value.

I. Don't you think that fluid diets are balanced?

S. As... I've seen for someone who is 56 those fluid diets?? I mean those portions.....

L23. I. You don't think that someone weighing 100kg needs that now?

S. No, because at this point in time, we are having a wound which must heal.

Trying to decrease the obesity of the patient.... that may be seen to later, once the wound has healed.

That is the intervention.

PROTOCOL ANALYSIS.

Content.

The content is familiar to the (S). However, content specific knowledge can be improved. The (S)'s interpretation of the prescription (L18) "Mobilize the patient" is limited to "mobilization by physiotherapist". He does not realize his practical role in the mobilization process.

Operations.

The problemsolving heuristic is definitely reinforced by the number of practise sessions this (S) has had. He displays structured thought and goal, directed behaviour.

Modality.

There is a balanced interplay between the (S) usage of the various formats.

Phase.

The (S) displays a systematic and structured approach to the problem. He has mastered the cognitive skills required during all of the phases (Input, Elaboration and Output)

Even when his intervention methods are questioned, he motivates his decision in a logical and substantiated way (L23).

Level of complexity, abstraction and efficiency.

This (S) succeeded in addressing a fairly abstract problem in an efficient manner. It should be borne in mind that the content was familiar to him.

INTERVIEW 3.

STUDENT (NS3) Re-reads the problem statement.

L1. So, I'm going to check the information. H'm.. I'll check the patient's observation chart. Wait let me first try and identify the problems of the patient.

L2. The problem here, is that there is a discharge on the patient's wound, and there is a sinus developing at the one end of the wound, so this is the problem around which the intervention must be taken.

L3. So I'll check the patient's observation charts. On the observation chart the temperature is very high, and there is a purulent discharge. The temperature can indicate that the patient has got some infection of the wound.

L4. S. So I go to the urine form... The fluids that are given to the patient... if they are sufficient enough it can lower the patient's temperature.

I. How?

L5. The problem here is that the patient's temperature is very high. So to reduce the temperature you can give the patient lots of fluid.

L6. So because the patient has an infection, I'll check the prescription chart to see what antibiotics the patient is receiving.So the antibiotics the patient is receiving is Ampicillin and Flagyl IVI and again, Panado... two Panado tablets that can help reduce the patient's temperature.

L7. So according to me I can say maybe the antibiotics the patient is receiving are not the set antibiotic for that specific infection... specific micro organism that is why the infection of the patient seems to be increasing because from the dressing record this has been taking place for three days.

L8. I. So what are you going to do about it.

S. My intervention is first to try and lower the patient's temperature. I will increase the fluid intake of the patient, and try and do a lukewarm sponging of the patient, and remove some of the bed covers of the patient.... too much bedclothes will increase the temperature of the patient.

Again, put a fan next to the patient so that the patient's temperature can be lowered. I will also give Panado not only for the pain, but also to lower the patient's temperature.

L9. I. Are there any other interventions?

S. I will also advise the person who is going to do dressings to irrigate the wound.

L10. I. Can you do it on your own?

S. No, I cannot do it, but I'll report the condition of the wound to the doctor who is in charge, and give input about the treatment of the patient.

That is all

PROTOCOL ANALYSIS.

Content.

Although the content of the material is familiar to him, he fails to identify other factors which may have influenced the patient's post-operative recovery, for example, the patient's weight.

Operations.

The (S) displays problem solving behaviour. He follows the problem solving guidelines, and plans his interventions around the various subproblems (L8).

Modality.

(S) employs a combination of modalities, and does not show any preference for any specific one.

Phase.

The (S) fails to look at all the relevant information. He does not realize that the patient weighs 100 Kg. This factor is therefore not considered in his intervention plan (Elaboration phase).

The fever and wound infection is systematically attended to. He however, does not stress the importance of monitoring the effectiveness of the intervention.

Level of complexity, abstraction, and efficiency.

The student addresses a relatively common post-operative problem in a structured fashion. His efficiency is illustrated by statements like "the temperature is very high" and "the patient has some infection of the wound". He does not relay all the data to normal values before making decisions about them.

INTERVIEW 4.

STUDENT (NS4) Re-reads Problem statement.

L1. So what we're given here is the operation the patient has undergone and that she has no history of chronic disease - and that she is having a discharging sinus at the end of the wound, no evidence of postoperative complications. So those are what we are given.

L2. Plus the documents: Temperature 38°C, Pulse 104, it is also high. It is .. (S. counts 1,2,3,) it is day three after the operation.

L3. (S. pages through documents) Now I am looking if there is anything prescribed for cleaning the wound....
So it's "Clean dressing"
(S. reads the rest of prescriptions).

L4. I. What are you looking at now?
S. So, I am looking at the report that is written about the wound of the patient... it was done the second day after the operation. So maybe there is a possibility of infection that is developing there.... because of the high temperature and increasing pulse.
But the patient has had some antibiotics Ampicillin and Flagyl.

L5. So my interventions will be.
-To determine whether the discharge is increasing or decreasing,
-And also to take some swabs... to send them to the lab.

L6. -Also some measures to try and decrease the patient's temperature.

-She is supposed to get some Panado's to try and decrease the temperature.

-I think, the temperature should be monitored on a two-hourly basis (S. looks at the documents).

L7. I. What are you thinking now?

S. No, I am looking at the pulse rate, if this is according to the infection then if the temperature decrease the pulse rate will decrease.

L8. This should be monitored together with the discharges from the wound. I'll also make sure that the nurses that are doing the dressings are strictly applying the aseptic technique.... because this may be the cause of the infection developing.

L9. So the interventions first : to monitor the temperature; to supervise that the nurses are applying the aseptic technique; also to make sure that the antibiotics are given as prescribed, ie. that the time is strictly adhered to, because otherwise it may influence the effectivity of the antibiotics.

So those are my basic interventions.

PROTOCOL ANALYSIS.

Content.

Depth of content knowledge is questionable. (S) scans the documents but does not substantiate his assumptions eg.

" If the temperature decrease the pulse rate will decrease" (L.7)

He stresses the importance of aseptic dressing technique (L8) but does not suggest that the wound be irrigated.

"Take some swabs and send to lab", (L.5) is an extremely vague statement.

Operations.

It appears as if the (S) follows the problem solving steps in a unfaltering way. He moves from one step to the next without dealing with sub-problems in a systematic way.

Modality.

(S) does not indicate any preference for a specific modality.

Phase.

Although it appears as if the (S) is systematically collecting the givens, he tends to scan the information in a haphazard fashion, constantly paging through the documents and moving them around. He also does not extract all the relevant information, (the fact that the woman weighs 100 Kg) during the input phase. During the elaboration and output phase, he tends to simply list the data, without qualifying information (L.5) or motivating his plans. He thus refrains from suggesting an alternative dressing technique. This may relate to a lack of content knowledge and/or practical experience in this area.

Level of complexity, abstraction and efficiency.

Although the (S) has mastered the steps in the problem solving heuristic to some extent, he lacks cognitive skills and subject specific knowledge to ensure an efficient problem solving technique. It should be borne in mind that the content was familiar to him.

INTERVIEW 5.

(NS5) Re-reads statement.

L1. This woman has got a hysterectomy, and now has a purulent discharge from her wound.

L2. So I'll firstly check H'm... her observation, especially her temperature. When I check the temperature, I find that it is very high... it's 38°C, and the pulse rate also increased so.... according to the temperature, I can say there might be an infection. (Glances at the other charts).

L3. The patient is getting antibiotics.
(moves documents around).

L4. I. What are you thinking now, or are you re-reading the statement?

S. H'm...m. I think I can take a puss-swab of the patient's wound to check if there is any organism causing that.
Also I can say that the patient's wound to be irrigated.

L5. I. Can you make that decision on your own?

S. (Laughs) I think so, on my own whether the dressing should be irrigated.

L6. I. What are you going to irrigate it with?

S. Povidone.....(Silence)

L7. I. What are you thinking now?

S. I am thinking what kind of solution that I can use for.... I'd use Povidone solution to irrigate the wound to get rid of discharges from the wound.

L8. I'd begin to observe as days go by can you see any discharges coming out of the patient's wound and can you also observe the temperature of the patient, whether it is coming down or still increasing.

L9. I. So are you satisfied with your intervention?

S. Another thing, I will check on the temperature.

(Silence)

L10. I. What are you thinking about now?

S. Also the wound area, whether there is signs of inflammation by the wound area.

L11. I. What signs?

S. Check for redness and swelling there.... I don't know the other things doesn't come to me (laughs)

PROTOCOL ANALYSIS.

Content.

(S) displays a lack of subject specific knowledge. This is indicated by the fact that she only addresses one of the patient's sub-problems. This narrow view ultimately influences the (S) decision making skills. She has not internalized the scope of practise of a nurse (L5). This is illustrated by the proposed change in the prescribed wound dressing.

Operations.

It is clear that the (S) focuses her attention on one aspect of patient care only. Initially she attempts to work systematically, however, she soon resorts back to old habits.

Modality.

(S) does not indicate any preference for a specific modality but does not assimilate the information extracted from the various modalities.

Phase.

(S) experiences difficulties throughout the three phases. This stems mainly from the fact that she does not explore the given information. She also does not visualize an obese woman who needs comprehensive post-operative care but concentrate her efforts around the patient's wound care.

The elaboration processes are directed toward one of the sub-problems and data concerning the weight, fever and medication is not manipulated to its fullest extent.

The output therefor only relates to wound care. Furthermore trial-and-error behaviour is displayed. (L5,6,7).

Level of complexity, abstraction, and efficiency.

Although the units are familiar to the student, the lack of content knowledge, cognitive skills as well as structured thought all contribute to an one-sided approach to the problem.

The intervention program did very little in addressing this particular student's skills.

INTERVIEW 6.

STUDENT (NS6) Re-read problem statement.

L1. This woman has undergone a total abdominal hysterectomy so there are many complications that can come as a result of it. Like, haemorrhage....post-operative haemorrhage... (reads again) She has no history of chronic diseases.

L2. The is a purulent discharging sinus which has developed.

L3. So, the first thing I am going to do is to look to the age of the patient, and also to look to the weight of the patient.

L4. I. What is the age of and the weight of the patient?

S. The weight is 100Kg meaning that she is obese, and she was born in 1938 so she is .. 54.. (does a calculation on paper) she's 56 years old.

So she is 56 years old and obese.

L5. So I look to the position of the patient, like a total abdominal hysterectomy.... this patient must be positioned in a semi-fowler's position... in a comfortable position, because she is obese, that may have an effect on the wound ... like it may cause, what we call, wound-gapping.

L6. The statement is saying also on dressing the wound you discover also that a purulent discharging sinus has developed.. so there is this sinus which has opened which has developed now letting out this purulent discharge.

L7. As an obese patient for an operation like this...for a total abdominal hysterectomy, infections can be easy..

especially if the people are obese.

L8. So... I'll position her, I'll look to the temperature.. the temperature is high.. so I'll try to sponge her. Also to keep an eye... that means.. to do.. to watch the temperature frequently let's say 1/4 hourly I'll be watching that.

L9. I would also try to pack the dressing tightly. On dressing the wound.....(reads statement)
I would try to change it frequently (the dressing)

L10. Let me check the other prescriptions (reads prescription chart).

L11. And the other thing that can be done broadly is to mobilize them as early as possible. So I'll.. I'd allow her to sit on the chair but only if the temperature is not rising so very much. (reads again).

L12. I. What are you looking at now?
S. I'm looking at the input and output chart... for me it has no relation to the whole thing because there is no history of any chronic disease, and Maintelyte is given.

L13. So checking the bloodpressure chart. Her bloodpressure is 120/85... let's see, certainly there is no problem with her bloodpressure and respiration. It's only the high temperature which may be caused by the infection.

L14. So to me, I'll be just... I'll be unhappy about the fact that she's obese and I'll be unhappy about the position ... concerned about the position and also... she's not so old to be so stout.

L15. The input and output, I have no problem so far. Temperature... I'll sponge her and she must be clean ... her wound that bleeding is coming out, but her Hb must be checked also to see if she is not loosing a lot of blood. Her skin also must be taken into consideration.

L16. And lastly everything must be documented, and be reported especially the purulent discharging sinus which has developed.

That's all.

PROTOCOL ANALYSIS.

Content.

(S) displays difficulty in drawing on his practical knowledge and experience, and makes non-specific suggestions around the wound-care (L9) "Try and change it frequently".

At no stage does he suggest an alternative dressing technique. However, it is clear that he knows the general post-operative care of a patient.

Operations.

The minute the (S) realizes that he is resorting to a trial-and-error problem solving behaviour, he corrects himself (L1,2,3).

(S) tries to structure his thought processes, but it is not always successful. (Discussed under heading "Phase")

Modality.

He strikes a balance between the different modalities, and does not show a preference for any one in particular.

Phase.

The student realizes his tendency to make sweeping perceptions (L1). He continues in a relatively systematic way to obtain additional data. He uses more than one source of information, but does not apply the elaborative processes, consistently in planning the interventions. "Packing the dressing tightly", once a patient has developed a sinus, is not the dressing technique of choice.

His planned interventions are not always the most practical ones either (L8) ie. monitoring the patients temperature 1/4 hourly.

He also tends to use lay terminology eg., (L14) " I'll be unhappy about" and "I'll be concerned about" and (L15) " I have no problem so far", when discussing subject specific interventions.

Level of complexity, abstraction, and efficiency.

Level of efficiency is influenced by the limited usage of subject specific language even though the units are familiar to him.

He does not display any difficulty in extracting information from a variety of sources.

APPENDIX VI

QUESTIONNAIRE.

EVALUATION OF THE INTERVENTION PROGRAM.

1. Has this program been helpful to you [Y] [ ] [N] [ ]
   Motivate your answer.

2. How do you feel the program could have been improved?

3. Do you have any suggestions for future planning of such a program?

4. (a) What were the strengths of the program?

   (b) What were the weaknesses of the program?

5. General comments.

THANK YOU.