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**LA THÈSE A ÉTÉ
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Development of a Print and Video Module on the Physical
Assessment of Low Back Pain For Nurses

Lorie Root

A Thesis-Equivalent

in

The Department

of

Education

Presented in Partial Fulfillment of the Requirements
for the Degree of Master of Arts at
Concordia University
Montréal, Québec, Canada

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ABSTRACT

Development of a Print and Video Module on the Physical Assessment of Low Back Pain For Nurses

Lorie Root

Nurses are assuming a greater role in the initial assessment and management of patients with common health problems. A videotape and print-based module was designed as a supplemental educational resource. It provides a problem-oriented approach to help nursing students and graduate nurses perfect or review their knowledge and skills for assessing patients with low back pain.

Summative evaluation of the module was conducted with baccalaureate nursing students in Ontario and Quebec. A four-group post-test only control group design was used. Students in the print-plus-video group demonstrated significantly higher recall of the features of the physical examination of low back pain than the control, print-only or video-only groups.

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SECTION ONE - MEDIA PRESENTATION

INTRODUCTION

Purpose

Nurses with varied educational backgrounds are assuming a greater role in the initial assessment and management of patients with common health problems. This development is the result of a movement within the profession to prepare nurses with advanced physical assessment skills. In Canada, this is known as an "expanded role" while in the United States nurses functioning in this capacity are officially called "nurse practitioners". The two terms will be used interchangeably in this paper.

The videotape and print-based module being evaluated has been designed to provide information to help nursing students and graduate nurses perfect or review their knowledge and skills for this expanded role. The module presents a problem-oriented approach to assessing patients with low back pain. It is intended for use as a supplemental educational resource within physical assessment skills courses or as an individualized instruction unit.

EDUCATIONAL CONTEXT

Nurse practitioners work in ambulatory care settings as members of multi-disciplinary health care teams. The nurse practitioner provides primary health care by being "the first contact between the client and the health care system and includes services for promotion and maintenance of health, and for complete and continuous care, including referral when required" (Registered Nurses Association of Ontario [R.N.A.O.], 1978, p.3). In other words, these nurses screen clients for risk factors and assess common health problems by taking a history and conducting a physical examination to detect abnormalities which require referral to a physician or other health professionals.

Nurse practitioners in the United States are accepted members of the health care team with a positive impact on the quality of patient care (Bibb, 1982; Brown, Brown & Jones, 1979; Powers, Jalowiec & Reichelt, 1984). Studies indicate that nurse practitioners are recognized and valued because they "1) improve (patient) access to care, 2) decrease health care costs, 3) are providers of choice for some consumers and 4) improve the quality of care by providing a team approach" (Bigbee, 1984, p. 109).

Although not promoted to the same extent in Canada, nurses fill this expanded role in several primary care settings. These include emergency departments, occupational health clinics, family practice units, northern outposts and in Quebec's Centres Local de Service Communautaires (CLSC).

The evolution of education of nurses for this expanded role has been uneven since its inception in the late 1960s. Initially, there were special university programmes designed for nurses working in the North. Then, special programmes were designed to provide nurses with the skills to function in the expanded role in urban and rural areas in southern Canada. Over the years, these programmes were gradually discontinued mainly because of lack of funding (R.N.A.O., 1978). Now, universities have incorporated the physical assessment skills used in this expanded role in their basic baccalaureate nursing programmes.

The traditional structure of physical assessment courses in university nursing programmes includes assigned readings and videotape and/or lecture demonstration of the examination of a "normal" body region (or organ system). Students practice these skills on classmates under the supervision of an instructor. They learn to assess body systems individually (i.e., cardiovascular, neurological, etc.). In general, these courses succeed in helping students learn the basic psychomotor skills involved in physical examinations. But students often find it difficult to view a problem holistically, as a problem involving several systems which must be assessed in order to understand the patient's condition.

Students are expected to continue practicing these skills when in actual ambulatory health care settings.

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During these clinical experiences, they are usually under the supervision of nurses working in the setting. Here, unlike the laboratory sessions where students practice on "normal" classmates, they are confronted by patients with actual complaints which they are expected to assess using the skills they have learned or are in the process of learning. The difficulty of evaluating student performance on "healthy" clients as opposed to those with abnormal findings is documented in nursing literature (Reese, Swanson & Cuning, 1979). Students have difficulty transferring their skills in assessing "normal" individual body systems to assessing an actual patient problem. They are trying to perfect their newly acquired physical assessment skills in a relatively unfamiliar and stressful context.

The current approach to teaching these skills is haphazard. Students must piece together their knowledge of anatomy, physiology and possible diagnoses during the examination to determine which systems to assess. They are left to integrate much of this material on their own. In an article describing a course in professional skills in medicine, Morgan mentions that "in general students learn the normal examination of the system in the (health) problem slightly ahead of the problem itself, so that the abnormality can then be compared with the normal" (1980, p. 144). This is rarely done in nursing programmes. Common health problems are sometimes discussed in classes.

Otherwise, students are expected to look up the relevant literature on their own. Meanwhile, they are supposed to practice their skills on real patients with real problems and try to focus and direct their examinations appropriately.

The clinical setting may impede the learning process. It can be stressful; students may not have patients with common complaints; they may not have enough patients with similar complaints to give them the opportunity to practice their approach; they may be linked with a nurse unskilled in teaching or too busy working in the clinic to give them enough supervision; and, they may not have faculty immediately available who are skilled in physical assessment (Reese, Swanson & Cuning, 1979; Root, 1983). With limited time and a large amount of material to learn, students cannot expect to see patients with all the possible physical complaints. Rather than depend totally on this approach, an alternative is needed to help students or practicing nurses learn how to assess common health problems in a more consistent, low-stress setting (Woolley, 1977). The module under discussion is designed to help students tailor their assessments to effectively and efficiently deal with the patient's problem. It refers to and builds on the knowledge and skills acquired in other classes and clinical experiences.

The difficulties nurses have with day-to-day practice when beginning their first jobs are well-documented

(Edmunds, 1982). Research on the role adjustment of nurse practitioners within the first six months of practice demonstrates that a better grounding in the assessment of common health problems might make the adjustment easier. Respondents to a survey rated the phrases "uncertainty about diagnosis and treatment" and "fear of missing something" as the most descriptive of their feelings (Lukacs, 1982, p. 21).

As with all professionals, independent study is one of the main ways for students, new graduates and experienced nurses to develop and maintain their skills on a continuing basis. For those particularly interested in working in an expanded role, this educational package promotes the development of assessment skills. Ideally, students will use this aid as a resource, seeking out qualified nursing faculty or health professionals to answer questions not covered in the module. It helps prepare interested students for a role which many programmes and work settings are ill-equipped to do.

Module Objectives

- 1) After studying the first two sections of the booklet, learners will be able to identify the common causes of low back pain and the features often found in the history and the physical examination.
- 2) After viewing the videotape and studying the print summary of the physical examination, learners will be able to list the basic elements to be included in the

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examination of patients complaining of low back pain

Target audience

There are two target audiences for this module. It is for university-prepared (baccalaureate and masters) nursing students and graduate nurses working or interested in working in ambulatory care settings where they are responsible for the initial assessment of patients with common health problems. They should be enrolled in or have completed a course in basic general physical assessment skills in Quebec or Ontario.

Outline of content and form of presentation

The module includes an informational booklet and a 16-minute videotape demonstrating the steps in the physical examination of a patient with low back pain. The booklet has three sections - 1) Common Causes of Low Back Pain, 2) History of The Chief Complaint and 3) Summary of the Physical Examination of Patients With Low Back Pain. Copies of the booklet and the videotape script are included in Appendices A and B respectively.

Rationale for media selection and production design

The booklet represents the way students traditionally seek out information -- reading journal articles. It acts as a print organizer by compiling information from several sources to give a more complete overview of the problem of low back pain. The first section, "Common Causes of Low Back Pain", reviews the risk factors and common causes of low back pain. A table format details the features to be

expected in the history and physical exam for each diagnosis. The content was evaluated by practicing nurses to ensure accuracy and relevance. Used in conjunction with the videotape for self-directed study, this section will help stimulate a sense of inquiry and recognition of relevant features. This detailed reading material was included so the videotape could be kept at a reasonable length to maintain the audience's attention (Wilson, 1982).

The second section, "History of the Chief Complaint", follows the history-taking format common to physical assessment courses. Therefore the important elements are covered in a recognizable way. It reviews the general questions common to all histories and includes the specific questions derived from the first part which should be asked of a patient complaining of low back pain. A print presentation on history-taking was used rather than a videotape because it is cheaper to produce, not so dependent on a visual presentation of information and easier to refer to and study in the clinical setting.

The third part, "Summary of the Physical Examination of Patients With Low Back Pain", summarizes the physical assessment as carried out in the videotape. It reviews the same material and is structured according to the systems to be assessed. This summary is intended for use as a checklist with the videotape. Used alone, the visual nature of the exam would be lost and students would have to rely on their imagination to understand the examination.

This has been tested in the summative evaluation of the module and will be discussed in the second half of this paper.

Videotape was chosen as the medium because it is already widely used and accepted in assessment courses. Video-cassette recorders are available in most universities and clinical settings as well as private homes. Each student is exposed to a uniform presentation by an expert who offers a model on which to base subsequent performance. The examination can be viewed uninterrupted or stopped and started according to the needs and wishes of learners. Unlike lectures, the videotape can be viewed again and again at the convenience of the learners (Armstrong, 1984). Studies comparing videotape with film have shown that videotape is cheaper to produce, is easier for students to use and is as effective as film in promoting recall of information presented (Davis, Hart, Hodder, Junus, MacBain, MacCormick, MacDonald, Simms & Whiston, 1983). As early as 1944, Heidgerken advocated the use of audiovisuals for simulating real life situations in nursing education. Studies with medical students have shown that videotape is as effective as personal teaching in communicating clinical skills and more effective than lectures accompanied by slides (Mir, Marshall, Evans, Hall & Duthie, 1984). These authors noted the greater ability of videotape to present more complicated concepts using still pictures (p. 34). In the videotape, still graphics are used

to visually convey some information, introduce the systems and for final review.

While some production decisions were out of the control of the producers, an attempt has been made to ensure that instructional quality was designed into the videotape according to empirical research on production variables. The rationale behind these production decisions was as follows:

As mentioned above, the videotape was kept short to maintain viewer attention;

The videotape was recorded in colour rather than black and white in congruence with research indicating that a presentation in colour "improves student achievement of specific educational objectives." They are preferred and expected by audiences (Dwyer, 1978, p. 150; Coldevin, 1981);

Music was used to introduce and bring the programme to an end in light of research indicating that "continuous music does not affect the learning from or attitudes towards an instructional film" and that "music only with the opening and closing titles was just as effective" (Seidman, 1981, p. 57);

In the script, the concept of "triple-redundancy" was followed by using the narrator voice-over with graphics and the nurse in live demonstration. This ensured repetition of the programme content in a different manner (Wilson, 1982, p. 82) and served to reinforce key points (Suter &

Waddell, 1981);

In accordance with Bonner's recommendation (1982) to "stimulate recall prerequisites" with adult learners, learners were reminded that the techniques - inspection, percussion, palpation and auscultation - which they were assumed to already know were used in the examination;

The set was designed as a clinical examination room. This realistic setting was intended to show the nurse as a positive role model when interacting with a patient during an examination. Students often have trouble working efficiently and courteously when instructing patients while doing examinations. This will benefit new practitioners developing their own professional style in working with patients;

Objective and subjective camera angles were both used throughout the recording. Research suggests that "subjective" camera angle might be advantageous for learning simple motor skills such as percussing the costovertebral angle. The "objective" angle has been found to be better for learning more complex skills such as human relations or, as in the videotape, the interaction between patient and nurse (Coldevin, 1981; Schramm, 1972);

Research shows that medical students tend to perform more complete physical examinations in more structured courses (Stillman et al., 1981). In light of this finding, the script was structured according to the organ systems familiar to the students from their courses.

SECTION TWO - PRODUCTION EVALUATION

LITERATURE REVIEW

A manual library search as well as computer searches using the ERIC and MEDLINE data banks were performed to help prepare a review of the relevant literature.

Surprisingly little research or evaluation has been done on the audiovisual media used in the training of nurses in physical assessment skills although videotape programmes have traditionally been a part of this training. Even the medical literature has little to offer. However, the need for research on methods to improve the teaching of clinical skills has been recognized by several authors (Daggett, Cassie & Collins, 1979; Rakestraw, Irby & Vontver, 1983).

Much of the literature involves comparisons of audiovisual presentations used with or without lectures. There was no significant difference in the amount of knowledge initially acquired in a study comparing one group of nursing students given a formal lecture (monomodal sensory stimulation) with another group given a lecture supplemented by audiovisual aids (multimodal sensory stimulation) (Thurston & Roberts, 1984). This supports the results of a study by Schorow, Osborne and Kelsey (1971). However, the lecture with audiovisual group did do significantly better on a delayed post-test three weeks later. The authors suggest that the "audiovisual aids during lecture apparently affected the storing phase of knowledge and made it more readily available for retrieval

three weeks later" (p. 25).

Several studies compared videotape with lecture presentations. Some showed no difference in short-term content retention with either method (Mir et al., 1984; Paegle, Wilkinson & Donnelly, 1980). One study showed no significant difference in post-test knowledge gains between groups of medical students given videotape demonstrations compared to groups given slide-illustrated lectures in the physical examination of the alimentary system. However, the videotape group did significantly better when performing an actual examination (Beswick, Cooper & Whelan, 1982). The authors speculated this resulted from the special property of videotape to allow the students to view a "dynamic process from many angles" enabling viewers to see "the interaction of the examiner with the patient" (p. 200).

A study with community health nurses compared an assessment course using the traditional approach (lecture/videotape, assigned readings and laboratory practice session) with a self-study approach (annotated bibliography of readings, an annotated list of audiovisual materials including videotapes) (Hagopian, Wemett, Ames, Glein, Osborne & Humphrey, 1982). Both groups were given packets of print information with material specific to the organ system they were studying. No difference was found between the two groups in a knowledge test, but the traditional group did achieve slightly better scores on a

physical assessment performance post-test. The authors suggested that physical examination skills are best taught in laboratory settings with faculty supervision.

Research by Krendl and Watkins (1983) studied the differential information processing of viewers of television programmes given different viewing sets and viewing modes. Viewing set was established by telling some subjects the educational objectives of the TV programme (education groups) while others were just told to view it for comparison with other programmes viewed at home (entertainment group). Viewing mode was compared by some subjects being allowed to stop the programme if they wished (stop group). Others viewed a non-stop version of the programme (non-stop group). A two-way analysis showed that viewing set significantly affected viewer processing of the information. Those given educational expectations did better than those expecting an entertaining programme. However, no significant differences were found for viewing mode. These findings have relevance for this evaluation where subjects were given the educational objectives of the programme. In light of the above findings and for practical considerations, subjects were not allowed to start and stop the videotape, even though they might choose to do so if viewing it individually.

The contradictory findings of these studies do not yield any conclusive suggestions. None of the studies compared the effect of videotape demonstration to print

materials. These media are normally used by students in independent study. This module, using print and videotape, was evaluated as an information aid for learners skilled in the basic assessment techniques. Groups of students given the print summary alone, the videotape alone and print summary with videotape were compared with a control group to assess their knowledge of the features in the assessment of patients with low back pain.

METHOD

Evaluation Objectives

A summative evaluation of the module was performed to answer the following questions:

1) Are students, who have not studied the module, knowledgeable about the common causes and major elements of the history and physical examination of patients with low back pain?

2) Can students who have not studied the module summarize in appropriate order the elements to be included in the examination of a patient with low back pain?

3) Is the recall of information in the videotape presentation enhanced with the print organizer?

4) Which treatment best provides for ordered recall of the features in the physical examination?

5) What are the learners' opinions of the module?

Sample

Forty-two baccalaureate-level nursing students voluntarily participated in the module evaluation. One subject was later disqualified from the sample group. Of the remaining 41, 22 (53.7%) attended McGill University while 19 (46.3%) studied at the University of Toronto. All subjects were women.

Twelve subjects (29.3%) were graduate diploma-level nurses returning to school for their baccalaureate degree. Ten of these had five or more years of nursing experience.

The baccalaureate nursing programme at the University

of Toronto usually takes four years to complete. McGill has a three-year post-CEGEP programme. All the McGill students and nine of the University of Toronto students were enrolled in their third year of study (75.6%). The rest of the University of Toronto students ($N = 10$, 24.4%) were in their fourth year.

All subjects but one had completed a course in physical assessment skills prior to the module evaluation. The student without a formal course was a registered nurse with 15 years nursing experience. She had successfully written the University of Toronto's entrance challenge examinations for physical assessment and therefore was not required to take the course. The physical assessment courses were held at different points in the curriculum of the two universities. At the University of Toronto, it was usually scheduled for the winter term of the second year. At McGill, it was offered in the fall term of the third year.

Twenty-three of the subjects (56.1%) stated their physical assessment course included the assessment and management of common health problems. Of these, only seven thought low back pain was one of the common problems covered. Some said they "couldn't remember". One student said their course emphasized the assessment of the "healthy patient"; another said the course was "geared towards the normality of findings". Since these students took the same physical assessment courses, these reports suggest there

was no particular emphasis on the assessment of common health problems. Clearly, independent study continues to be the main means for students to increase their knowledge of these problems.

Eighteen (43.9%) of the subjects reported they had already had a patient complaining of low back pain. Of these, only one had actually performed the physical assessment of her patient(s); two had assisted another nurse or doctor with the assessment(s); nine had observed another nurse or doctor perform the assessment(s) and six neither performed nor saw the assessment(s). One student remarked that any assessments she observed were "infrequent and brief".

Design and Procedure

A four-group post-test only control group design was used. Subjects were randomly assigned to one of the four groups. Control group members ($N = 11$) did not receive the lesson booklet or videotape. They were asked to complete a demographic questionnaire (DQ) and completed tests of their knowledge of the assessment of low back pain. The remaining 30 subjects were distributed equally to the three treatment groups. All three groups received the "Causes of Low Back Pain" and "History-taking" portions of the lesson booklet. The print-only group and the print-plus-video groups also received the print summary of the physical assessment. The video-only and print-plus-video groups viewed the videotape.

R			DQ	01	02 (Control group)
R	C & H	X1	DQ & ME	01	02
R	C & H	X2	DQ & ME	01	02
R	C & H	X3	DQ & ME	01	02

C & H = Causes and History-taking sections of the booklet
 X1 = Print Summary of Physical Examination only
 X2 = Videotape only
 X3 = Videotape + Print Summary of Physical Examination
 DQ = Demographic Questionnaire
 ME = Module Evaluation Questionnaire

The demographic questionnaire (DQ) was used to collect information pertaining to subjects' educational background and clinical experience with patients with low back pain. A module evaluation questionnaire (ME) with a five-point, rating scale was given to subjects in the treatment groups. This questionnaire was used to gather student opinions of the module. Three main categories of questions focussed on, 1) the design of the module, 2) the video production features and, 3) the overall evaluation and potential use of the module. These two questionnaires (enclosed in Appendix C) served as interpolated tasks between the module presentation and the two criterion measures.

The criterion measures involved two post-tests. A multiple-choice questionnaire (01) was administered to assess student comprehension of information covered in the first two sections of the booklet. A short-answer case study question (02) simulating a clinical session was used to assess student recall of the features to be included in the basic physical assessment of a patient with low back

pain. Copies of both tests are enclosed in Appendix D.

RESULTS

The scores of a fourth year student from the University of Toronto were removed from the print-plus-video group. This student and her classmates had written an examination the morning of the module evaluation. Unlike the others, she agreed to participate in the evaluation only after intense pressure by her peers. She was too tired to apply herself to the task and completed the evaluation in considerably less time than other group members. Her scores were extremely low and did not resemble those of others in the treatment group. Her scores were even lower than those of the control group. Since her contribution could not be considered equivalent to that of the other participants, she was disqualified from the study sample.

Multiple-choice Test Scores

Items of the multiple-choice questionnaire were tested statistically for reliability. The Cronbach's alpha for all groups was .56.

Analyses of variance were performed on the multiple-choice and short-answer test scores of the following:

- 1) Students from McGill compared to those from the University of Toronto;
- 2) Third year students compared to fourth year students;
- 3) Graduate nurses compared to basic students;

4) Students who already had patients with low back pain compared to those who did not;

5) Third year students compared to fourth year students at the University of Toronto;

6) Basic students having prior experience with patients with low back pain compared to those without;

7) Graduate nurses having prior exposure to patients with low back pain compared to those without;

No statistically significant differences were found in any of these comparisons.

A one-way analysis of variance was performed comparing the test scores of the multiple-choice questionnaire for the control group and three treatment groups. The harmonic mean was used to adjust for the unequal cell sizes of the treatment groups. See Table 1: A significant difference was found between the four groups, $F(1,37) = 3.29, p = .03$. See Table 2.

Post hoc comparisons using the Tukey test revealed that the print-only group was the only group significantly greater than the control group. The print-only group was not significantly different from the video-only or print-plus-video group. There was no significant difference between the video-only and print-plus-video groups.

Short-answer Test Scores

To remove examiner bias, the short-answer question was evaluated by two raters using a structured, objective

Table 1

Means and Standard Deviations of Multiple-choice
Questionnaire and Short-answer Question Scores by
Treatment Group

	Treatment			
	Control	Print	Video	Print + Video
Cell size	11	10	10	10
Multiple-choice Test Scores				
<u>M</u>	9.00	12.60	10.40	11.20
<u>SD</u>	2.00	3.13	3.47	1.81
Short-answer Test Scores				
<u>M</u>	5.32	9.95	9.90	13.35
<u>SD</u>	1.85	3.87	2.98	2.29

Table 2

Summary Table - Multiple-choice Scores by Treatment

<u>Analysis of Variance</u>					
Source	D.F.	S.S.	M.S.	F Ratio	F Prob.
Between Groups	3	71.1	23.72	3.29	.03
Within Groups	37	266.40	7.20		
Total	40	377.56			

checklist based on the original videotape demonstration and print summary. A total of two points were allowed for correct order and 15 points were given for accurate recall of the elements featured in the physical examination. The raters' scores were highly correlated ($r = .92$). These scores were averaged to give one raw score per subject. The mean scores are summarized in Table 1. A one-way analysis of variance using the harmonic mean (i.e. average cell size) was performed comparing the short-answer question scores and four groups. See Table 3. It suggests a significant difference between the groups, $F(1,37) = 16.06$, $p < .001$.

In post hoc comparisons using the Tukey test, the print-plus-video group was found significantly greater than all the other groups. The print-only and video-only were not significantly different from each other, but both were significantly greater than the control group.

Student Evaluations of the Module

Thirty subjects completed the evaluation of the module. Members of the control group did not receive the lesson booklet or view the videotape and therefore were unable to give their opinions. Questions pertaining to the videotape were answered by 20 subjects since the subjects in the print-only group did not see the videotape.

Student ratings of the design and presentation of the module were generally quite favourable. The list below gives the frequency of responses and student comments for

Table 3

Summary Table - Short-answer Scores by Treatment

<u>Analysis of Variance</u>					
<u>Source</u>	<u>D.F.</u>	<u>S.S.</u>	<u>M.S.</u>	<u>F Ratio</u>	<u>F Prob.</u>
Between Groups	3	344.19	114.73	16.06	0
Within Groups	37	264.29	7.14		
Total	40	608.48			

each question of the questionnaire. The actual questions, rating scale and frequency of responses are enclosed in Appendix C.

Design of the Module

1) Asked if the module objectives were appropriate, 86.7% (N = 26) rated them "appropriate" to "highly appropriate", 10% (N = 3) rated them as "adequate" and 3.3% (N = 1) rated them as "somewhat inappropriate". Student comments ranged from describing the objectives as "very clear and concise" and "understandable immediately" to "to [sic] general".

2) Asked if the objectives had been met, 83.3% (N = 25) felt they were met "well" to "very well" and 16.7% (N = 5) felt they were met "adequately".

3) Most students (80%, N = 24) rated the difficulty of material as "appropriate to highly appropriate", 10% of them (N = 3) felt it was "adequate" and 10% (N = 3) felt it "somewhat inappropriate". Two students wrote that it was "highly appropriate for university education" and was "neither too difficult nor too easy". One student felt it was "somewhat inappropriate" because it contained "too much detail to retain in one reading".

4) Eighty percent of students (N = 24) rated the amount of material as "appropriate" to "highly appropriate", 13.3% (N = 4) rated it "adequate" and 6.7% (N = 2) rated it as "somewhat inappropriate". Students reported that it was "very thorough" and "appears to

appropriately encompass the related systems". Some expressed the concern that "so much information may be forgotten without further study".

5) The organization and structure of the content to facilitate learning was reported by most students 86.7% ($N = 26$) as being "well" to "very well" done, 10% ($N = 3$) rated it "adequate", and 3.3% ($N = 1$) rated it as "poorly" done. One student commented that she found the "systems (format) easier to remember", likely making her future physical examinations "more thorough".

6) Ninety percent ($N = 27$) described the amount of repetition of the main features of the physical examination as "adequate" to "optimum". The remaining 10% ($N = 3$) were neutral and said there was "some repetition". One subject in the video-only group felt that there was "adequate repetition" but that the video repetitions were "too long and became boring".

Video Production Features

7) When it was suggested that the print summary might as effectively and less expensively be used alone without the videotape, eighty-five percent ($N = 17$) responded that the video "helped greatly", 10% ($N = 2$) said it "helped somewhat" and 5% ($N = 1$) felt it was "neutral in effects". Students felt it "helped greatly" because it enabled them "to better visualize some of the procedures". However, one student commented that "some of the tests were too far away to be seen properly".

8) Seventy-five percent (N = 15) evaluated the videotape presentation as "above average" to "highly effective" as an educational medium. The remaining 25% (N = 5) rated it "moderately effective". One student commented that it would be "better" if the "camera had been closer to the nurse and patient".

9) Ninety-five percent (N = 19) rated the audio as "clearly" to "highly intelligible". Five percent (N = 1) rated it "acceptable". No students found it "unacceptable".

10) Fifty percent (N = 10) stated that the nurse "added somewhat" to "greatly" to the videotape. Twenty-five percent (N = 5) said she had "no effect" and 25% (N = 5) felt she "detracted somewhat" from the effectiveness of the videotape. Students who made further comments said that she "did not appear enthusiastic", "seemed nervous and unsure of herself" and "didn't talk smoothly at times."

11) Generally the subjects liked the insertions of the narrator's voice. Most subjects (84.2%, N = 16) said the inserts "added somewhat" to "greatly" to the videotape and 15.8% (N = 3) felt it made no effect. No subjects said they detracted from the videotape. One student commented the inserts added "some variation" to the videotape.

12) Eighty-five percent (N = 17) rated the pace of the videotape as "adequate" to "highly appropriate". The remaining 15% (N = 3) felt it was "somewhat inappropriate". Many described the pace as "a little too

fast".

Overall Evaluation & Uses of the Module

13) Asked if they enjoyed the module, 53.3% (N = 16) rated it as "above average" to "very enjoyable". The remaining 46.7% (N = 14) described it as "satisfactory". One student wrote that "such modules should be incorporated into courses on physical examinations rather than just stressing the normality of findings. It would be more effective for all concerned if the nurse had some idea of the potential disorder." (Underlining by the student.) One student who rated the module "satisfactory" said it was "very dry". She later said she "was not interested in the area" (i.e., orthopedics).

14) For the overall evaluation, 79.3% (N = 23) rated the module as "above average" to "outstanding", the rest rated it as "average". One student in the print-only group, who rated it as "above average" said it was "difficult to digest everything in short time", that it "needs another method of presenting" the material and that it "provided information which (she) was not aware of". Another subject in the print-only group rated it as "outstanding" but added that she "would like to have viewed the videotape to reinforce learning". She felt that "viewing (the) physical assessment in addition to reading about it, may be a much more effective means of learning and retaining that knowledge". Others in the video-only and print-plus-video groups described the module as "unique and helpful",

"informative", "clear and concise". One student commented that it "would be better if (one) could see more of what nurse sees".

15) The majority (96.7%, N = 29) said they would use the module if it were available at their school. The student who said she was "not interested in the area" was the only one (3.3%) to say she would not use it. Reasons for the affirmative response were varied. Students reported that it was "well laid out", "a good summary", "helpful as a guide", "a good learning tool" and uses "good learning techniques". They felt it provided "information which helps guide assessments", "reviews neurological components" and provided "increased review of assessment skills". One student liked the information it provided "about the abnormal" which she felt helped to "appreciate and differentiate from the normal (and ultimately enhance our care)." One student wrote "no other is available, this is a useful tool". Several students said they would use it if "they needed it and were working with such clients". One student found it "quite specific" and informative about why to assess the various factors". One student said she would use it because it "is a more interesting form of learning rather than strictly books". Another student said she would use it for the "special assessment tests for low back pain."

16) Asked if they would recommend that their school buy the module, 96.7% (N = 29) said they would. Only the

student (3.3%) who said she would not use it said she could not recommend it. Several students commented that it's "a great idea" and should be used as "an adjutant [sic] to teaching more general assessment skills" since "modules of this sort can facilitate learning". One student said her "physical assessment course only covered normal findings. These modules would be helpful to the course." Another student wrote that "with regard to certain testing procedures, (they are) easier to comprehend when visually displayed."

17) Forty-five percent (N = 9) said the videotape would "definitely help" with future physical assessments of patients with low back pain. The remaining 55% (N = 11) said it would "probably help" them. One student reported it would "definitely help" because prior to the module she "really knew nothing about it." She thought she could now "do a physical assessment."

DISCUSSION

Differences in test scores could not be accounted for by demographic characteristics (i.e., school attending, year in nursing programme, graduate R.N. versus basic student and prior experience with low back pain patients) since no significant differences were found when these were compared. The short answer test scores were affected by the different treatments. However, it is worth noting that the graduate nurses did not perform significantly better than the other students. This suggests the module as it stands is adequate for their use as well.

The relatively low mean scores of the control group for the multiple-choice test suggest that students were not adequately prepared with the background knowledge needed to assess patients with this common complaint. The means of the treatment groups were not appreciably higher and were not much more than 50% correct. Treatment group scores were expected to be greater than those of the control group. Yet, although the control group mean was less than all treatment group means, the only significant difference was between the control and print-only groups. Neither the video-only nor the print-plus-video groups were significantly greater than the control group and the treatment groups were not significantly different from each other. These results could indicate that students have some prior knowledge of the causes, history and physical examination of low back pain.

The more plausible explanation for these results lies in the vastly different reliability estimates of the multiple-choice test items for each group. The different Cronbach's alphas obtained for each treatment group suggest the items were not highly intercorrelated. This means the test items were likely not testing the experimental treatment. They were measuring different, unknown factors for each group making the test itself unreliable. The videotape alone could not account for these differences since alpha scores of the print-only and videotape-only groups were both highly positive. The negative alpha of the print-plus-video group may mean that the time allowed for undisturbed study may have given these results. The video-only and print-only groups had slightly more time to study the booklet without distraction. Meanwhile, the print-plus-video group had to read the entire booklet plus watch the videotape. The increased amount of material this group was expected to study and integrate compared to the other groups may have disturbed them. This would be a function of the evaluation conditions and not necessarily reflect on the effectiveness of the module when actually used by students on their own time and without these artificial constraints.

Comparisons of control group with treatment groups scores in the short-answer clinical simulation question quite powerfully suggest that students were not adequately prepared and did not have the prior knowledge needed to

conduct the basic physical examination. Despite a possible "cueing effect" produced by the multiple-choice test, the mean control group score was quite low (Newble, Baxter & Elmslie, 1979). Recall of information in the videotape presentation was enhanced with the print organizer. As expected, the print-only group did not do as well as students who also saw the videotape. The print-plus-video group was found to best provide for the ordered recall of the features of the physical examination. This goes beyond results attained by Beswick et al. in their comparison of videotapes with slide-illustrated lectures. In their study, although little difference was found in factual knowledge learned, the videotape group did better in the actual physical examination. In this evaluation, the print-plus-video group was the best in recalling the elements of the physical examination and, by extension, are expected to be able to perform the examination better than the others. The print-only and video-only groups also did appreciably better than the control group in the recall test. However, the content redundancy and repetition of the dual-symbol system presentation enabled the print-plus-video group to exceed the scores of both these groups. Conceivably the different symbol systems "highlighted different aspects of (the) content" and eased processing of the information by calling on "different mental processes" for "recoding and elaboration" (Salomon, 1979, p. 226-227). In light of these results, the greatest

benefit can be expected by studying the booklet and videotape together.

This summative evaluation strongly supports the stand that baccalaureate nursing students are not adequately prepared for assessing a common health problem such as low back pain. Student test scores and opinions of the module indicate that despite an extremely low budget and production flaws, it was still educationally effective. Students suggested the following changes for future productions: videotapes should be slower paced, employ professional talent and use more close-ups for demonstrations.

Except for the one student who disliked the topic, the module was well received by most students. The majority recommended its use at their university and claimed they would use it if it were available. They confidently predicted they would be capable of correctly assessing future patients with low back pain. This strongly reinforces the positive evaluation of the module as an effective learning tool. Even though the module proved instructionally effective for the simulation, any generalizations to actual clinical situations must recognize that students would initially have to be supervised during their assessments of real patients. This improves on the ideal present clinical teaching situation.

The module is a concise, easy-to-use and enjoyable learning aid. It offers students the chance to "practice"

the assessment without the usual environmental restrictions and stressors. They are able to watch an "expert" perform the assessment correctly; they do not need a patient "on hand". They can view the videotape or review the booklet at their own convenience and in an unhurried setting. The systems format was well accepted because it builds on background knowledge, and thereby gives students better guidance on how to approach the problem holistically. The familiar organization of the booklet helps direct and focus the flow of their examinations and facilitates the communication of their findings to other health professionals. The module gives students more potential control over their clinical experiences. This is a positive contribution to their preparation for working in an expanded role.

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APPENDIX A

THE PHYSICAL ASSESSMENT OF LOW BACK PAIN - AN INSTRUCTIONAL MODULE

This module presents a problem-oriented approach to assessing patients with low back pain. It is designed to be used as a supplemental educational resource within physical assessment skills courses or as an individualized instruction unit.

The module contains:

- 1) Lesson booklet - with three sections
 - "Common Causes of Low Back Pain"
 - "History of the Chief Complaint - Low Back Pain"
 - "Summary of the Physical Examination of Low Back Pain"
- 2) Videotape - "Physical Assessment of Low Back Pain"

Objectives of the module

- 1) After studying the first two sections of the booklet, learners will be able to identify the common causes of low back pain and the features often found in the history and the physical examination.
- 2) After viewing the videotape and studying the print summary of the physical examination, learners will be able to list the basic elements to be included in the examination of patients complaining of low back pain.

COMMON CAUSES OF LOW BACK PAINRISK FACTORS:

- 1) Obesity
- 2) Inactivity
- 3) Poor posture
- 4) Poor muscle tone
- 5) Emotional stress
- 6) Advancing age
- 7) Lifting excessive loads
- 8) Insomnia, fatigue
- 9) Past history of back injury
- 10) Poor body mechanics
- 11) Poor sleeping habits (ie. poor mattress, position of sleep)
- 12) Occupation - truck driver, secretary, executive
- 13) Positive family history of back pain (especially for males)
- 14) Recreation habits (eg. strenuous sports only on weekends)
- 15) Body build - tall height, women with large breasts

"Low back strain characterized by chronic recurrent low back aching without neurological abnormality is the commonest form of back pain. The major concerns in approaching the patient with back pain are:

- 1) Are major neurological deficits present or likely to occur?
- 2) What potentially dangerous diseases might be causing the back pain?" (Wasson et al., p. 72)

MUSCULOSKELETAL CAUSES -- Pain is usually due to muscle strain spasm, but may result from bony destruction.

<u>Possible Diagnoses</u>	<u>History</u>	<u>Physical Examination</u>
1) Muscle strain (acute or chronic)	Often with history of poor body mechanics, no radiating pain to legs.	Muscle spasm, limited painful ROM of back, no back pain with straight leg raises, no neurologic deficit.
2) Malignant primary and metastatic tumours	Severe progressive pain, history of malignancy or weight loss.	Spinal tenderness with palpation or percussion.
3) Vertebral or pelvic fracture	History of trauma, older patients and those on steroids are at risk.	Localized spinal tenderness, may have neurological changes, pain with Pelvic Rock test.
4) Ankylosing spondylitis	Stiffness and low back pain usually with young males.	Sacroiliac tenderness, reduced forward flexion of spine, dorsal kyphosis and loss of lumbar lordosis with advanced disease.
5) Osteoarthritis (resulting from degenerative changes in the discs, vertebral bodies)	Older patients, other joint pains, often occurs after minor incident or routine exertion, pain in lower back, may be immediate or	Pain with worn facet joint increases with arching and straightening the back, bending forward relieves it; limited hip ROM and

joints.)

increase over 1-2 days, can radiate to buttocks and down leg above the knee.

pain with Patrick's test suggests hip joint disease; pain with Pelvic Rock test may indicate sacroiliac joint disease.

6) Osteomyelitis

History of septic focus and fever (recent UTI or abdominal surgery), back pain constant and often progressive over weeks.

Pain with spinal percussion, little or no fever.

NEUROLOGIC CAUSES -- Pain is usually due to irritated spinal sensory nerve roots.

<u>Possible Diagnoses</u>	<u>History</u>	<u>Physical Examination</u>
1) Major neurological deficit	Often post-trauma, may be secondary to tumour or herniated disc, history of abnormal bladder function, unable to move legs or pain radiating to legs.	bladder enlarged after voiding, absent deep tendon reflexes, weakness and sensory loss of extremities, may have flaccid anal sphincter, sensory loss in perineum.
2) Herniated intervertebral disc	Pain often after lifting, usually radiates into leg(s) or buttock(s), pain increases with coughing or sneezing.	Difficulty standing or walking, lists to side opposite pain, decreased patellar and achilles reflexes (L4-L5 and L5-S1 discs most frequently affected), sensory loss and weak muscles of extremities, pain with straight leg raises at less than 60 degrees, thigh pain with dorsiflexion of foot when leg lowered, positive Bowstring's sign (ie. pain in leg or back), pain from protruding disc or pinched nerve increases with forward flexion of spine and decreases with extension.

VISCERAL CAUSES -- Low back pain may be referred from diseased pelvic or abdominal viscera.

<u>Possible Diagnoses</u>	<u>History</u>	<u>Physical Examination</u>
1) Gynecological disease	Vaginal discharge, Lower abdominal or sacral discomfort, related to menstrual cycle.	abnormal pelvic exam.
2) Penetrating peptic ulcer	History of peptic ulcer, pain in back above lumbar area, often relieved by antacids.	Stool positive for occult blood, epigastric tenderness.
3) Pancreatitis	Pain relieved with leaning forward, upper epigastric discomfort, history of alcoholism or gallstones.	abdominal tenderness, decreased bowel sounds.
4) Abdominal aortic aneurysm	Upper abdominal discomfort, patient over 50 years.	May have absent femoral pulses, palpable pulsatile abdominal mass.
5) Renal disease (usually kidney infection or stone)	May have unilateral flank pain that may radiate to perineum; dysuria or hematuria, may have fever.	Costovertebral-angle tenderness.

OTHER CAUSES may be osteoporosis, abnormal back alignment, rheumatoid arthritis, psychogenic conditions, herpes zoster infection, chronic respiratory problems, prostatitis, post-partum back pain related to lax sacroiliac joints, tuberculosis and heavy metal poisoning.

References are at the end of this booklet.

HISTORY OF THE CHIEF COMPLAINT - LOW BACK PAIN

LOCATION - Is it localized or diffuse?
 - Does it radiate into buttock(s) or down the leg(s)? If so, where (ie. posterior, anterior or lateral) and how far down the leg(s)?

ONSET - What brought it on?
 1) Recent trauma or fall?
 2) Unusual exercise?
 3) Heavy lifting, especially with twisting of back?
 4) History of sitting for more than 50% of working hours?
 5) New mattress?
 6) Body position on onset?
 7) Time of day (end of workday?)

QUALITY - Is it sharp, dull, penetrating, achy, stiff, etc.?

INTENSITY - Is it mild, moderate or severe?
 - Does it interfere with ADL (sleeping, working, eating, playing, etc.)?

COURSE - Is it constant or intermittent?

DURATION - Does it last seconds?, minutes?, hours?, days?

AGGRAVATING FACTORS - Is it worse with moving, sitting, bending, coughing, defecating, laying supine, sneezing, menstruating etc.?

RELIEVING FACTORS - Is it relieved by application of heat, use of analgesics or antacids, with bedrest, leaning forward etc.?

MANAGEMENT TO PRESENT
 - SELF MANAGEMENT (eg. analgesics, heating pad, liniment, girdles etc.).
 - TREATMENT (eg. medical/surgical, acupuncture, massage, chiropractor etc.) and TESTS (eg. spinal x-ray, myelogram) done elsewhere and note dates.

ASSOCIATED SYMPTOMS - REVIEW PERTINENT SYSTEMS
 - Are any of these symptoms also present? - Urinary incontinence, inability to void, pain or numbness in buttocks or legs, abdominal pain, hip pain, dysuria, urinary frequency, hematuria, fever or chills, nausea, weight loss, CVA tenderness, vaginal discharge, or sexual impotence?

MEDICAL HISTORY - Is there a history of malignancy, recent surgery or spinal fracture, chronic bronchitis, cough, emphysema, hypertension, diabetes mellitus, angina, gallstones, alcoholism or peptic ulcer?

MEDICATIONS - Any medications used regularly? On PRN basis? Especially note use of adrenal steroids or anticoagulants.

SUMMARY OF THE PHYSICAL EXAMINATION OF PATIENTS WITH LOW BACK PAIN

The patient STANDS for the first half of the examination and LIES SUPINE on the examining table for the second half. Remember your patient is in pain. Don't make he or she jump on and off the table unnecessarily.

Note GENERAL APPEARANCE - facial expression, body build, etc.

Note POSTURE AND GAIT - limping, listing to one side, limited back, hip or leg movements, trouble breathing, difficulty disrobing, walking, bending, sitting etc..

Take VITAL SIGNS - T, P, R and BP

 PATIENT STANDING

MUSCULOSKELETAL SYSTEM

Inspect BACK ALIGNMENT

- 1) Normal spine viewed laterally has cervical and lumbar concavities and thoracic convexity. Look for flattening of the lumbar curve often associated with muscle spasm.
- 2) Kyphosis - or hunchback - is an abnormal accentuation of the forward flexion at the thorax.
- 3) Lordosis - or swayback - is an accentuation of the lumbar curve.
- 4) Scoliosis is a lateral curvature of the spine. The height of the iliac crests and the shoulders is often unequal.

Inspect back for bruises, swelling, muscle spasm, muscle wasting.

Check TENDER AREAS by having the patient point them to you. Palpate the non-tender areas first. Cover the spinal column, lower ribs, iliac crests, sacrum and coccyx. Muscle spasm feels like a firm mass over a 3 to 4 cm. area. Crepitus can mean there is an underlying bone fracture or subcutaneous emphysema.

Percuss the spinal column.

Check for COSTOVERTEBRAL-ANGLE TENDERNESS by bluntly striking each angle firmly, but not hard, over the kidneys. Tenderness over this area suggests kidney infection or inflammation.

Assess RANGE OF MOTION

- 1) Spine - forward flexion - palpate the spinous processes to assess their separation during flexion - pain in this position may mean a protruding disc or pinched nerve. If one side of the back is higher than the other your patient may have scoliosis.
 - backward extension - pain may indicate a worn facet joint.
 - lateral flexion and rotation at the waist - difficult to do with muscle spasm or sprain.
- 2) Hip and Leg - flexion, extension, lateral movement and

rotation.

* * * * *

NEUROLOGIC SYSTEM

The Dermatomes roughly show the skin bands innervated by the sensory or posterior nerve roots.

Check MOTOR FUNCTION by

- 1) walking on toes to test the first sacral nerve root.
- 2) walking on heels to test the fourth and fifth lumbar nerve root.

 PATIENT LYING SUPINE ON EXAMINING TABLE

Check SENSORY FUNCTION

- 1) Light touch with cotton ball
 - follow dermatomes bilaterally - ask patient to indicate if it feels the same for both legs - sensation should be symmetrical
 - A - touch anterior aspect of thigh and knee for L3 & L4
 - B - touch lateral aspect of calf and space between the great and second toes for L4 & L5
 - C - touch the lower aspect of the legs and lateral aspect of the foot for S1
- 2) Repeat A, B and C using Pinpricks.

Check DEEP TENDON REFLEXES

- 1) Patellar reflex - to assess the fourth lumbar nerve.
- 2) Achilles reflex - to check the first sacral nerve.

Check MOTOR STRENGTH against your resistance

- 1) Push down as patient raises leg
- 2) Pull up as patient lowers leg
- 3) Dorsiflexion at ankles - patient pulls feet up against your hands
- 4) Plantar flexion - patient pushes feet down against your hands

* * * * *

CARDIOVASCULAR SYSTEM

Check CAPILLARY REFILL at toes

Check PULSES of both legs

- 1) Femoral
- 2) Posterior tibialis
- 3) Dorsalis pedis

* * * * *

SPECIAL TESTS designed to assess low back pain.

Do STRAIGHT LEG RAISES

- 1) Passively raise one leg at a time with knee fully extended - try to raise the leg up 60 degrees from the

table or until pain is felt in the back or posterior thigh - pain may indicate tight hamstrings or possible nerve root irritation or compression.

- 2) Lower leg slightly and dorsiflex foot - pain will be felt down the posterior thigh with sciatic irritation.

Check for the BOWSTRING SIGN

Rest the patient's foot on your shoulder with the knee slightly flexed. Press firmly at the popliteal fossa with your thumbs. Pain radiating down the leg or in the back confirms nerve root compression.

Hip pain can be confused with back pain - especially with elderly patients. Check **HIP RANGE OF MOTION** and then do **PATRICK'S TEST** to check for hip joint disease.

Do **PATRICK'S TEST** by placing the patient's heel on the opposite knee with the hip rotated externally. Stress the joint by pressing on the opposite iliac crest and the flexed knee. Any pain with this movement indicates hip disease.

Finally do the PELVIC ROCK TEST

Place your hands on the iliac crests and gently press inward. Be careful, any laxity may indicate a pelvic fracture. Pain may mean a nondisplaced fracture, sacroiliac joint disease or injury.

Now you should have enough information to make your nursing diagnosis and consult with a physician. Discuss the need for further tests such as x-rays or blood work. Together you can come up with a diagnosis and management of your patient's problem.

* * * * *

SUMMARY CHECKLIST

**CHECK... GENERAL APPEARANCE
POSTURE & GAIT
VITAL SIGNS**

MUSCULOSKELETAL SYSTEM
Back Alignment
Tender Areas
Range of Motion

NEUROLOGIC SYSTEM
Sensory Function
Reflex Function
Motor Function

CARDIOVASCULAR SYSTEM
Capillary Refill
Pulses

SPECIAL TESTS
Leg Raises
Bowstring Sign
Hip ROM & Patrick's Test
Pelvic Rock Test

REFERENCES

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APPENDIX BPHYSICAL ASSESSMENT OF LOW BACK PAIN

Slide 1 - Cartoon of woman
lifting baby

Slide 2 - Cartoon of man
watching TV

Slide 3 - Cartoon of man
in bed

Slide 4 - Title - Physical
Assessment of Low Back
Pain

Music IN

Music DOWN AND UNDER

#1 - Cam 3 MS Narrator
with set in background

NARRATOR: ABOUT FOUR OUT OF FIVE CANADIANS WILL HAVE A BACK PROBLEM AT SOME TIME IN THEIR LIVES. TEN PER CENT OF THESE PEOPLE WILL EXPERIENCE CHRONIC AND RECURRING PAIN. GOOD INITIAL ASSESSMENT AND MANAGEMENT OF LOW BACK PAIN HELPS TO ENSURE RAPID AND FULL RECOVERY AND MAY PREVENT FURTHER PROBLEMS. ... THERE IS NO SINGLE, "RIGHT" WAY TO DO A PHYSICAL EXAMINATION. THIS PROGRAMME WILL SHOW YOU THE SYSTEMS AND SPECIAL TESTS THAT SHOULD BE INCLUDED IN THE ASSESSMENT OF A PATIENT WITH LOW BACK PAIN.

Slide 5 - Inspection,
Palpation, Percussion,
Auscultation

NARRATOR: YOU WILL SEE THAT TECHNIQUES YOU HAVE ALREADY LEARNED -- INSPECTION, PALPATION AND PERCUSSION -- ARE THE TECHNIQUES USED. YOU WILL USE AUSCULTATION WHEN TAKING BLOOD PRESSURE.

NARRATOR: MOST LOW BACK PAIN IS DUE TO MUSCLE STRAIN OR SPASH. THIS IS OFTEN THE RESULT OF POOR BODY MECHANICS WHEN LIFTING OR MOVING THINGS. OTHER POSSIBLE CAUSES - SUCH AS KIDNEY INFECTION, NEUROLOGICAL DAMAGE AND TUMOURS - MUST BE CONSIDERED WHEN TAKING THE HISTORY AND CARRYING OUT THE PHYSICAL EXAMINATION. TRY TO CONCENTRATE ON THE SEQUENCE OF TECHNIQUES IN THE ASSESSMENT YOU ARE ABOUT TO SEE. THINK WHY EACH OF THEM HAS BEEN INCLUDED. DON'T WORRY ABOUT TAKING NOTES. ALL THE STEPS IN THE EXAMINATION ARE DESCRIBED IN THE BOOKLETS WHICH ACCOMPANY THIS VIDEOTAPE.

#2 - Cam 3 WS Narrator in foreground, RN & PT to the left in background

NURSE: Hell-o, I'm Fiona Griffiths and this is my patient, Suzanne. We will be demonstrating the physical assessment of low back pain. Throughout the examination it is important to be systematic. The first half of the examination should be done while the patient is still standing. Then she should lie supine for the second half. Remember your patient is in pain. So don't make her jump on and off the examining table unnecessarily.

#3 - Cam 2 HS RN & PT at desk

#4 - Cam 1 CU RN picking up instruments from desk, shows them & puts them into labcoat pockets

NURSE: Gather together your tools beforehand. You will need a tape to measure leg length, a reflex hammer to assess reflexes, and a cotton swab and safety pin to assess sensation.

#5 - Cam 2 MS RN & PT standing in front of desk

NURSE: Remember your examination must reflect the information gathered in the patient's history. Right from the beginning note your patient's general appearance. Look at her posture and gait as she walks into the examining room, while taking the history and when taking her vital signs. Take note of any signs of pain - such as limping, listing to one side, limited movements or trouble breathing. Note if she is obviously overweight and out of shape.

Slide 6 - Musculoskeletal System

NARRATOR: THE FIRST SYSTEM TO ASSESS IS THE MUSCULOSKELETAL SYSTEM.
(PAUSE)

#6 - Cam 2 WS RN & PT standing in front of examining table, PT angled toward camera so as to show spinal curvature

NURSE: After taking her vital signs, have your patient stand up and

begin by inspecting her back alignment. Check for an abnormal curvature of the spine.

Slide 7 - Normal Spine

NARRATOR: NORMAL BACK CURVATURE LOOKS LIKE THIS.

Slide 8 - Kyphosis

NARRATOR: KYPHOSIS - OR HUNCHBACK - IS AN ABNORMAL ACCENTUATION OF THE FORWARD FLEXION AT THE THORAX. HERE WE SEE NORMAL ALIGNMENT ON THE LEFT COMPARED WITH KYPHOSIS ON THE RIGHT.

Slide 9 - Lordosis

NARRATOR: ABNORMAL LORDOSIS - OR SWAYBACK - SHOWN ON THE RIGHT - IS AN ACCENTUATION OF THE LUMBAR CURVE. THIS IS OFTEN PRESENT IN PATIENTS WITH WEAK ABDOMINAL MUSCLES.

Slide 10 - Scoliosis

NARRATOR: SCOLIOSIS IS A LATERAL CURVATURE OF THE SPINE. NOTE THE DIFFERENCE IN HEIGHT OF THE SHOULDERS AND THE ILIAC CRESTS.

#7 - Cam 1 WS O/S RN showing her opening PT's gown and looking at back

NURSE: Look for any bruises or swelling, spasm or wasting of the muscles.

#8 - Cam 2 MS PT angled towards camera pointing to tender area (right lower back) - then RN feels PT's back

NURSE: Now palpate her back. Don't torture your patient. Ask her to show you the painful areas and palpate the nontender ones first. ... Feel for tenderness, lumps or signs of curvature which are not visible. Be sure to cover all the areas of the lower back - especially the spinal column, lower ribs, iliac crest, sacrum and coccyx. Muscle spasm feels like a firm mass over a 3 to 4 cm. area. Crepitus can mean there is an underlying bone fracture or subcutaneous emphysema.

#9 - Cam 1 MCU RN & PT - RN hits PT's middle back

NURSE: Now, percuss the spinal column. ... Check for costovertebral-angle tenderness by bluntly striking each angle firmly ... but not hard ... over the kidneys. Tenderness over this area suggests kidney infection or inflammation.

#10 - Cam 2 MS PT bends forward and RN feels her spine - then PT bends backward towards RN

NURSE: Assess spinal range of motion. From an upright position, have your patient bend forward as far as she can without pain. ... Palpate the spinous processes to assess how far they separate with flexion of the spine. ... Pain with this movement may mean a protruding disc or pinched nerve. If, in this position, one side of the back is higher than the other, she may have scoliosis. ... Have her extend backwards. Pain with this movement may indicate a worn facet joint.

#11 - Cam 3 WS PT bending from side to side and then twists at the waist - RN stands behind her

NURSE: Have her flex laterally to both sides and then twist at the waist. This is often difficult to do with a muscle spasm or sprain.

#12 - Cam 2 MS PT raises each leg to front, back, side & rotates

NURSE: Now, check hip and leg mobility by assessing flexion, extension, lateral movement and rotation. (5 SECOND PAUSE)

Slide 11 - Neurologic System

NARRATOR: BACK PAIN ASSESSMENT DOES NOT ONLY INVOLVE EXAMINING THE

MUSCULOSKELETAL SYSTEM. A NEUROLOGIC EXAMINATION INCLUDING TESTS FOR SENSORY, REFLEX AND MOTOR FUNCTIONS IS NEEDED.

Slide 12 - Dermatomes

NARRATOR: HERE WE SEE THE PATTERN OF DERMATOMES. THESE ROUGHLY SHOW THE SKIN BANDS INNERVATED BY THE SENSORY OR POSTERIOR NERVE ROOTS.

#13 - Cam 2 WS RN & PT -
PT walks towards RN on
toes

NURSE: While your patient is still standing, test the motor function of the first sacral nerve by having her walk on her toes.

#14 - Cam 1 MS O/S RN - PT
walks towards RN on heels

NURSE: Test the fourth and fifth lumbar nerves by having her walk on her heels.

#15 - Cam 2 MCU RN & PT -
PT gets on table

NURSE: We are now ready to begin the examination on the examining table. ... Suzanne please lie on the table face up. ... Remember to continue observing for limited range of movement.

#16 - Cam 3 MS RN behind table - takes out cotton ball

NURSE: Use the cotton ball to test for sensory loss. Follow the dermatomes bilaterally. Ask your patient to tell you if it feels the same for both legs. Sensation should be symmetrical.

#17 - Cam 2 HCU PT waist down

NURSE: Lightly touch the anterior aspect of the thigh and knee for L3 and 4. ... Touch the lateral aspect of the calf and the space between the great and second toes for L4 and 5. ... Touch the lower lateral aspect of the legs and lateral aspect of the foot for S1. ... Repeat this test using pinpricks. Take it easy with the safety pin. Your patient isn't a pincushion!

#18 - Cam 1 WS RN & PT on table RN hitting PT's knees with hammer

NURSE: Deep tendon reflexes should also be symmetrical. First check the patellar reflex to assess the fourth lumbar nerve root.

#19 - Cam 2 CU RN hitting PT's ankles with hammer - try to see ankle jerk

NURSE: Next tap the achilles tendon. A diminished or absent ankle jerk indicates a problem at the first

sacral root.

#20 - Cam 3 MS RN & PT -
PT raises legs - then RN
pushes and pulls against
PT's feet

NURSE: Test the motor strength of each leg against your resistance. Push down on her leg as she tries to raise it and pull up as she tries to lower it. ... Test dorsiflexion at the ankles by having your patient pull up against your hands. ... Test plantar flexion by asking her to push down against your hands.

#21 - Cam 2 WS RN measures
length from PT's belly
button to ankle

NURSE: Now check for leg length discrepancies. Use the tape to measure the distance from the umbilicus to the medial malleolus of both legs.

Slide 13 - Cardiovascular
System

NARRATOR: NOW CHECK THE
CARDIOVASCULAR SYSTEM. (PAUSE)

#22 - Cam 2 WS RN
squeezing PT's toes

NURSE: Squeeze her toes to assess capillary refill. This decreases the blood flow and makes the tissue turn pale.

#23 - Cam 3 CU PT's toes

NURSE: Normal colour should return within 3 seconds. It takes longer with poor circulation. Note any abnormalities in skin colour or temperature.

#24 - Cam 2 WS RN takes PT's pulse at groin, ankle & foot

NURSE: Check the pressure and amplitude of the pulses of both legs. ... The femoral. ... The posterior tibialis. ... And the dorsalis pedis.

Slide 14 - Special Tests

NARRATOR: THE LAST PART OF THE ASSESSMENT INVOLVES SPECIAL TESTS. YOU PROBABLY HAVEN'T ENCOUNTERED THESE TESTS BEFORE. THEY ARE USED SPECIFICALLY FOR ASSESSING LOW BACK PAIN. (PAUSE)

#25 - Cam 3 WS RN raises PT's legs (RN at foot of table)

NURSE: Next perform passive straight leg raises, one leg at a time. The knee should be fully extended. Try to raise the leg up 60 degrees from the table or until pain is felt in the back or posterior thigh. ... Pain may indicate tight hamstrings or possible nerve root

irritation or compression.

#26 - Cam 2 MS RN lowers PT's legs and flexes foot - then puts PT's foot on her shoulder and presses behind knee

NURSE: Next you lower her leg slightly and dorsiflex her foot. With sciatic irritation she will feel pain down the posterior thigh. Check for the Bowstring sign by resting her foot on your shoulder with her knee slightly flexed. Now press firmly at the popliteal fossa with your thumbs. Pain radiating down the leg or in the back confirms nerve root compression.

#27 - Cam 1 MS RN rotates PT's hip - then presses on knee and pelvis

NURSE: Hip pain can be confused with back pain - especially with elderly patients. Check hip range of motion and do Patrick's test to check for hip joint disease. Place her heel on the opposite knee with the hip rotated externally. Stress the joint by pressing on the opposite iliac crest and the flexed knee. Any pain with this movement indicates hip disease.

#28 - Cam 2 MS O/S RN presses on PT's pelvis (RN in front of table)

NURSE: Now do the pelvic rock test. Place your hands on the iliac crests and gently press inward. Be careful, any laxity may indicate a pelvic fracture. Pain may mean a nondisplaced fracture, sacroiliac joint disease or injury.

#29 - Cam 3 MS Narrator in foreground and RN & PT in background

NARRATOR: THIS ENDS THE BACK AND LEGS EXAMINATION OF YOUR PHYSICAL ASSESSMENT. DEPENDING ON THE HISTORY AND THE PHYSICAL FINDINGS YOU MAY NEED TO ASSESS OTHER SYSTEMS: IT MAY BE NECESSARY TO CHECK THE ABDOMEN AND THE RESPIRATORY AND CARDIOVASCULAR SYSTEMS; YOU MAY NEED TO DO GYNECOLOGIC AND RECTAL EXAMINATIONS AS WELL AS A MORE DETAILED NEUROLOGIC EXAMINATION. NOW LET'S REVIEW THE MAJOR FEATURES OF THIS ASSESSMENT.

Slide 15 - General appearance, posture & gait, vital signs

NARRATOR: AS WITH ALL PHYSICAL EXAMINATIONS, IT IS GOOD PRACTICE TO NOTE THE GENERAL APPEARANCE AND TAKE THE VITAL SIGNS OF YOUR PATIENT. FOR LOW BACK PAIN YOU MUST ALSO CHECK THEIR POSTURE AND GAIT.

Slide 16 - Musculoskeletal system

NARRATOR: START BY EXAMINING THE MUSCULOSKELETAL SYSTEM. CHECK BACK ALIGNMENT, NOTE TENDER AREAS AND ASSESS RANGE OF MOTION OF THE SPINE AND LEGS.

NARRATOR: NEXT CHECK THE

Slide 17 - Neurologic
System

NEUROLOGIC SYSTEM. ASSESS THE
SENSORY, REFLEX AND MOTOR FUNCTIONS
OF THE BACK AND LEGS.

Slide 18 - Cardiovascular
System

NARRATOR: THEN ASSESS THE
CARDIOVASCULAR SYSTEM. CHECK
CAPILLARY REFILL AND PULSES OF BOTH
LEGS.

Slide 19 - Special Tests

NARRATOR: FINALLY DO THE SPECIAL
TESTS DESIGNED FOR ASSESSING LOW BACK
PAIN.

#30 - Cam 3 MCU Narrator
in foreground and RN & PT
in background

Music SLOWLY UP AND UNDER

NARRATOR: NOW YOU SHOULD HAVE
ENOUGH INFORMATION TO MAKE YOUR
NURSING DIAGNOSIS AND CONSULT WITH A
PHYSICIAN. DISCUSS THE NEED FOR
FURTHER TESTS SUCH AS X-RAYS OR BLOOD
WORK. TOGETHER YOU CAN COME UP WITH A
DIAGNOSIS AND MANAGEMENT OF YOUR
PATIENT'S PROBLEM.

Credits

Music DOWN AND OUT (AFTER CREDITS)

APPENDIX CDEMOGRAPHIC QUESTIONNAIRE

1. What university do you attend?

CHECK ONE: McGill University
 University of Toronto

2. What year are you enrolled in your baccalaureate nursing programme?

CIRCLE ONE: FIRST SECOND THIRD FOURTH

3a. Are you a graduate R.N. returning to school for your baccalaureate degree?

CIRCLE ONE: YES NO

3b. If you are already a R.N., state the number of years you have worked as a nurse.

_____ years.

4a. Have you already completed a course in physical assessment skills?

CIRCLE ONE: YES NO

4b. If the answer is YES, was the assessment of common patient problems covered in this course?

CIRCLE ONE: YES NO

4c. If the answer is YES, was the assessment of low back pain included as one of these common problems?

CIRCLE ONE: YES NO

5a. In your clinical experience have you ever had a patient(s) with low back pain?

CIRCLE ONE: YES NO

5b. If YES, did you perform, assist with or observe someone else (eg. nurse, physician) performing the physical assessment of the patient(s) low back pain?

CIRCLE ONE:

YES - I performed the physical assessment

YES - I assisted with the assessment

YES - I observed a nurse or physician performing the assessment

NO - I did not do or see the assessment

MODULE EVALUATION

A major part of this evaluation is to determine what features of the module you liked or did not like. Please rate each item on a 5-point scale by circling the appropriate number and writing your comments below. These comments will be used to help produce better productions in the future.

1) Are the stated objectives appropriate?

1	2	3	4	5	N/A
Highly appropriate	Appropriate	Adequate	Somewhat inappropriate	Highly inappropriate	

Comments:

2) Does the module meet the stated objectives?

1	2	3	4	5	N/A
Very well	Well	Adequately	Poorly	Very poorly	

Comments:

3) Is the level of difficulty of the material covered appropriate? Specify below if the concepts presented are too difficult or too easy.

1	2	3	4	5	N/A
Highly Appropriate	Appropriate	Adequate	Somewhat inappropriate	Highly inappropriate	

Comments:

4) Is the amount of material covered in the module appropriate?

1	2	3	4	5	N/A
Highly appropriate	Appropriate	Adequate	Somewhat inappropriate	Highly inappropriate	

Comments:

5) Is the content organized and structured to facilitate learning?

1	2	3	4	5	N/A
Very well	Well	Adequately	Poorly	Very poorly	

Comments:

6) Do the "system checklists" (eg. musculoskeletal, neurologic, etc.) provide for optimum repetition of the main features of the physical examination?

1	2	3	4	5	N/A
Optimum repetition	Adequate repetition	Some repetition	Too little or too much	Far too little or far too much	

Comments:

7) The content of the videotape and the physical examination summary in the booklet overlap. The module might be just as effective if only the printed lesson booklet were produced. Does the videotape help or inhibit learning the physical examination? The videotape

1	2	3	4	5	N/A
Helps greatly	Helps somewhat	Neutral in effects	Inhibits somewhat	Inhibits greatly	

Comments:

8) Is the video presentation effective in its use of lighting, background set, camera shots, graphics used etc.? (Do not feel you must give a highly technical evaluation. Just make a judgement as to whether the video is effective as an educational medium.)

1	2	3	4	5	N/A
Highly effective	Above average	Moderately effective	Below average	Ineffective	

Comments:

9) Is the audio intelligible?

1	2	3	4	5	N/A
Highly Intelligible	Clearly intelligible	Acceptable	Barely intelligible	Unintelligible	

Comments:

10) Do the personality and behaviour of the nurse add to or detract from the effectiveness of the video presentation?

1	2	3	4	5	N/A
Adds greatly	Adds somewhat	Neutral in effects	Detracts somewhat	Detracts greatly	

Comments:

11) Does the insertion of the narrator's voice to introduce new segments of the examination add to or detract from the presentation?

1	2	3	4	5	N/A
Adds greatly	Adds somewhat	Neutral in effects	Detracts somewhat	Detracts greatly	

Comments:

12) Is the pace of the videotape presentation appropriate? Specify below if it is too fast or too slow.

1	2	3	4	5	N/A
Highly appropriate	Appropriate	Adequate	Somewhat inappropriate	Highly inappropriate	

Comments:

13) Did you enjoy the module?

1	2	3	4	5	N/A
Very much	Above average	Satisfactory	Below average	Not at all	

Comments:

14) What is your overall evaluation of the module?

1	2	3	4	5	N/A
Outstanding	Above average	Average	Below average	Very poor	

Comments:

15) If this module were available at your university, would you use it?

Circle: YES NO

Comments: Why or why not?

16) Would you recommend that modules on common health problems be adopted by your university?

Circle: YES NO

Comments:

17) Do you think this videotape will help you with your physical assessments of patients with low back pain?

1	2	3	4	5	N/A
Definitely	Probably	Do not know	Probably not	Definitely not	

Comments:

ABSOLUTE AND RELATIVE FREQUENCIES OF RESPONSES TO THE
MODULE EVALUATION QUESTIONS

1. Are the stated objectives appropriate?

	Absolute frequency	Relative frequency
1 - Highly appropriate	11	26.8
2 - Appropriate	15	36.6
3 - Adequate	3	7.3
4 - Somewhat inappropriate	1	2.4
5 - Highly inappropriate	0	0
N/A	11	26.8
	<u>41</u>	<u>100.0</u>

2. Does the module meet the stated objectives?

	Absolute frequency	Relative frequency
1 - Very well	13	31.7
2 - Well	12	29.3
3 - Adequately	5	12.2
4 - Poorly	0	0
5 - Very poorly	0	0
N/A	11	26.8
	<u>41</u>	<u>100.0</u>

3. Is the level of difficulty of the material covered appropriate?

	Absolute frequency	Relative frequency
1 - Highly appropriate	5	12.2
2 - Appropriate	19	46.3
3 - Adequate	3	7.3
4 - Somewhat inappropriate	3	7.3
5 - Highly inappropriate	0	0
N/A	11	26.8
	<u>41</u>	<u>100.0</u>

4. Is the amount of material covered in the module appropriate?

	Absolute frequency	Relative frequency
1 - Highly appropriate	5	12.2
2 - Appropriate	19	46.3

3 - Adequate	4	9.8
4 - Somewhat inappropriate	2	4.9
5 - Highly inappropriate	0	0
N/A	11	26.8
	<hr/> 41	<hr/> 100.0

5. Is the content organized and structured to facilitate learning?

	Absolute frequency	Relative frequency
1 - Very well	11	26.8
2 - Well	15	36.6
3 - Adequately	3	7.3
4 - Poorly	1	2.4
5 - Very poorly	0	0
N/A	11	26.8
	<hr/> 41	<hr/> 100.0

6. Do the "system checklists" (eg. musculoskeletal, neurologic, etc.) provide for optimum repetition of the main features of the physical examination?

	Absolute frequency	Relative frequency
1 - Optimum repetition	13	31.7
2 - Adequate repetition	14	34.1
3 - Some repetition	3	7.3
4 - Too little or too much	0	0
5 - Far too little or too much	0	0
N/A	11	26.8
	<hr/> 41	<hr/> 100.0

7. The content of the videotape and the physical examination summary in the booklet overlap. The module might be just as effective if only the printed lesson booklet were produced. Does the videotape help or inhibit learning the physical examination? The videotape ...

	Absolute frequency	Relative frequency
1 - Helps greatly	17	41.5
2 - Helps somewhat	2	4.9
3 - Neutral in effects	1	2.4
4 - Inhibits somewhat	0	0
5 - Inhibits greatly	0	0
N/A	21	51.2
	<hr/> 41	<hr/> 100.0

8. Is the video presentation effective in its use of lighting, background set, camera shots, graphics used etc.?

	Absolute frequency	Relative frequency
1 - Highly effective	4	9.8
2 - Above average	11	26.8
3 - Moderately effective	5	12.2
4 - Below average	0	0
5 - Ineffective	0	0
N/A	21	51.2
	<u>41</u>	<u>100.0</u>

9. Is the audio intelligible?

	Absolute frequency	Relative frequency
1 - Highly intelligible	6	14.6
2 - Clearly intelligible	13	31.7
3 - Acceptable	1	2.4
4 - Barely intelligible	0	0
5 - Unintelligible	0	0
N/A	21	51.2
	<u>41</u>	<u>100.0</u>

10. Do the personality and behaviour of the nurse add to or detract from the effectiveness of the video presentation?

	Absolute frequency	Relative frequency
1 - Adds greatly	2	4.9
2 - Adds somewhat	8	19.5
3 - Neutral in effects	5	12.2
4 - Detracts somewhat	5	12.2
5 - Detracts greatly	0	0
N/A	21	51.2
	<u>41</u>	<u>100.0</u>

11. Does the insertion of the narrator's voice to introduce new segments of the examination add to or detract from the presentation?

	Absolute frequency	Relative frequency
1 - Adds greatly	3	7.3
2 - Adds somewhat	13	31.7
3 - Neutral in effects	3	7.3

4 - Detracts somewhat	0	0
5 - Detracts greatly	0	0
N/A	22	53.7
	<u>41</u>	<u>100.0</u>

12. Is the pace of the videotape presentation appropriate?

	Absolute frequency	Relative frequency
1 - Highly appropriate	1	2.4
2 - Appropriate	9	22.0
3 - Adequate	7	17.1
4 - Somewhat inappropriate	3	7.3
5 - Highly inappropriate	0	0
N/A	21	51.2
	<u>41</u>	<u>100.0</u>

13. Did you enjoy the module?

	Absolute frequency	Relative frequency
1 - Very much	4	9.8
2 - Above average	12	29.3
3 - Satisfactory	14	34.1
4 - Below average	0	0
5 - Not at all	0	0
N/A	11	26.8
	<u>41</u>	<u>100.0</u>

14. What is your overall evaluation of the module?

	Absolute frequency	Relative frequency
1 - Outstanding	1	2.4
2 - Above average	22	53.7
3 - Average	6	14.6
4 - Below average	0	0
5 - Very poor	0	0
N/A	12	29.3
	<u>41</u>	<u>100.0</u>

15. If this module were available at your university, would you use it?

	Absolute frequency	Relative frequency
1 - Yes	29	70.7

2 - No	1	2.4
N/A	11	26.8
	<u>41</u>	<u>100.0</u>

16. Would you recommend that modules on common health problems be adopted by your university?

	Absolute frequency	Relative frequency
1 - Yes	29	70.7
2 - No	1	2.4
N/A	11	26.8
	<u>41</u>	<u>100.0</u>

17. Do you think this videotape will help you with your physical assessments of patients with low back pain?

	Absolute frequency	Relative frequency
1 - Definitely	9	22.0
2 - Probably	11	26.8
3 - Do not know	0	0
4 - Probably not	0	0
5 - Definitely not	0	0
N/A	21	51.2
	<u>41</u>	<u>100.0</u>

APPENDIX DTEST A - MULTIPLE-CHOICE QUESTIONSPlease circle one answer per question.

1. Patients taking steroid medications have greater risk of suffering from low back pain caused by:
 - a. muscle strain
 - b. gynecological disease
 - *c. vertebral fracture
 - d. pancreatitis
 - e. urinary tract infection

2. Which of the following is least likely to be found with a patient with a kidney infection?
 - a. flank pain
 - b. hematuria
 - c. CVA tenderness
 - *d. pain relieved with leaning forward
 - e. fever

3. The Pelvic Rock Test is testing specifically for which diagnosis?
 - a. ankylosing spondylitis
 - *b. pelvic fracture
 - c. gynecological disease
 - d. abdominal aortic aneurysm
 - e. pelvic tumours

4. Which of the following is not a known risk factor for low back pain?
 - a. obesity
 - *b. short height
 - c. advancing age
 - d. occupation - secretary
 - e. emotional stress

5. The most common cause of low back pain is:
 - a. osteoarthritis
 - b. herniated intervertebral disc
 - c. abnormal back alignment
 - *d. muscle strain
 - e. poor body mechanics

6. A patient's pain is relieved when he bends forward. His back pain may be due to:
 - *a. worn facet joint
 - b. loss of lumbar lordosis
 - c. pancreatitis
 - d. a & c
 - e. all of the above

7. Your 68 year old patient has low back pain with upper abdominal discomfort and absent femoral pulses, she may suffer from:
 - a. pancreatitis
 - b. peptic ulcer
 - *c. abdominal aortic aneurysm
 - d. ankylosing spondylitis
 - e. all of the above

8. Which of the following conditions is characterized by no neurological changes?
- *a. muscle strain
 - b. malignant tumour
 - c. herniated intervertebral disc
 - d. a & b
 - e. vertebral fracture
9. Which condition is suspected with a young male patient complaining of stiffness and low back pain?
- a. osteoarthritis
 - b. herniated intervertebral disc
 - c. osteomyelitis
 - *d. ankylosing spondylitis
 - e. gonorrhoea
10. Pain with a protruding disc:
- a. increases with extension of the spine
 - *b. increases with forward flexion of the spine
 - c. decreases with forward flexion of the spine
 - d. a & c
 - e. b & d
11. Tumours are especially suspected with which one of the following?
- a. stiffness
 - b. pain relief with antacids
 - *c. weight loss
 - d. pulsatile abdominal mass
 - e. dysuria
12. Pain radiating into the legs can be found:
- a. with herniated intervertebral discs
 - b. with malignant tumours
 - c. with abnormal bladder function
 - d. post-trauma
 - *e. all of the above
13. When examining the patient with low back pain, it is important to assess if there are:
- a. neurological deficits
 - b. limitations in range of motion
 - c. focal tenderness
 - d. potentially dangerous diseases causing the pain
 - e. a & b
 - *f. a & d
 - g. c & d
 - h. all of the above
14. Which of the following describe major causes of back pain?
- a. musculoskeletal
 - b. visceral
 - c. neurological
 - d. a & c
 - *e. all of the above
15. A 59 year old patient complains of joint and low back pain

occurring after routine activities. The pain radiates down the right leg to the knee and has been increasing over the past two days. Which of the following diagnoses would most likely be suspected?

- a. muscle strain
 - b. herniated intervertebral disc
 - * c. osteoarthritis
 - d. osteomyelitis
 - e. vertebral fracture
16. Which of the following are possible causes of back pain?
- a. tuberculosis
 - b. lax sacroiliac joints
 - c. depression
 - d. shingles
 - * e. all of the above
17. A patient complains of pain in the back above the lumbar area which is relieved by antacids. On examination he has epigastric tenderness and occult blood is detected in his stool. What might be the diagnosis?
- a. pelvic inflammatory disease
 - * b. penetrating peptic ulcer
 - c. nephrolithiasis
 - d. aortic aneurysm
 - e. pancreatitis
18. On examination, a patient complaining of low back pain has limited painful range of motion of the spine, no back pain with straight leg raises and no neurological deficit. What is most probable diagnosis?
- a. metastatic tumour
 - b. ankylosing spondylitis
 - * c. muscle strain
 - d. osteomyelitis
 - e. pancreatitis
19. A patient states that his back pain increases with coughing and sneezing. What diagnosis is this often associated with this aggravating factor?
- a. kidney infection
 - b. muscle strain
 - c. ankylosing spondylitis
 - * d. herniated intervertebral disc
 - e. osteomyelitis
20. Back pain related to worn facet joints:
- a. increases with forward flexion of the spine
 - b. decreases with arching and straightening the spine
 - * c. decreases with forward flexion of the spine
 - d. a & b
 - e. is usually found in young males

(* - denotes the correct response)

TEST B - Short answer question

Imagine you are working in an ambulatory health care setting. One of your responsibilities is to perform the initial assessment of patients who come with common health problems. Today you have a patient complaining of low back pain. You have completed the history of this chief complaint. You are now ready to conduct the physical examination. List the physical features you would check when examining your patient. Try to list all the features of the examination in the order you would do them. Answer in point form. Use both sides of this paper if necessary.

SCORING KEY FOR TEST B

The total possible score for Test B was 17 points. Fifteen points were given for content recall and two points for correct order. Students were given one point for accurately recalling each of the elements featured in the Summary Checklist of the videotape and the print summary of the physical examination.

SUMMARY CHECKLIST

CHECK... GENERAL APPEARANCE
POSTURE & GAIT
VITAL SIGNS

MUSCULOSKELETAL SYSTEM
Back Alignment
Tender Areas
Range of Motion

NEUROLOGIC SYSTEM
Sensory Function
Reflex Function
Motor Function

CARDIOVASCULAR SYSTEM
Capillary Refill
Pulses

SPECIAL TESTS
Leg Raises
Bowstring Sign
Hip ROM & Patrick's Test
Pelvic Rock Test

RAW TEST SCORES BY TREATMENT GROUP

GROUP	MULTIPLE-CHOICE QUESTIONNAIRE SCORES	SHORT-ANSWER TEST SCORES
CONTROL	13	8.5
	7	6
	10	6.5
	11	4.5
	7	8
	7	5
	8	4.5
	11	5
	9	3
	8	5
8	2.5	
PRINT ONLY	16	13
	10	7
	11	12.5
	14	11.5
	14	10.5
	15	13
	14	8
	7	7
	9	3.5
	16	13.5
VIDEO ONLY	14	17
	15	9
	10	8.5
	10	11
	14	8
	5	9.5
	9	8.5
	3	6
		9.5
		12
VIDEO PLUS PRINT	13	17
	10	14.5
	9	9.5
	14	13
	13	10
	12	15
	12	13.5
	10	13.5
	10	15
	9	12.5