Application of a Proposed Graphic Chart for pain as Fifth Vital Sign in Nursing Practice at Assiut University Hospital

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Abstract: Careful and regular assessment of pain improves the perception of nurses concerning the impact of pain on their patients' lives to enhance the quality of its management. Monitoring pain as the fifth vital sign is currently practiced in many developed countries. Therefore, the present study aimed to apply of a proposed graphic chart for pain as fifth vital sign in nursing practice in Assiut University Hospitals- Egypt. An exploratory descriptive research design was carried out in five units including (medical, surgical, burn, trauma & orthopedic units). The study subjects consisted of 60 nurses available at the time of the study. An interview questionnaire, nurses' opinionnaire scale, nurses' audit and proposed five vital signs graphic chart were used for data collection. Results revealed that nurse's mean age \pm SD was (27.85 \pm 7.82 years), mean years of experience was 7.40 \pm 3.94 years. The majority of nurses agreed upon chart feasibility (81.7%) & quality of pain care (83.3%). Overall 83.3% of the nurses agreed upon the proposed graphic chart. Auditing of patients files revealed full application of the new change by 93.3%, 63.3% of nurses for graphic part &70 % for pain assessment part. It is concluded that the majority of the nurses had full application of the proposed change & it is recommended to be implemented in nursing practice in different health settings. Nurses need to be accountable to improve their knowledge and skills in assessing pain, which necessitates implementing educational programs through in-service training and continuing nursing education. It is also necessary for hospitals to require nurses' notes on their charts for pain assessment and management.

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Keywords: Vital sings: are objective guideposts that provide data to determine a person's state of health; **Pain:** is an unpleasant sensory and emotional experience associated with actual or potential tissue damage; **Pain rating scale:** it a scale used to assess the severity of pain.

1. Introduction

Vital signs are body temperature, pulse, respiration, blood pressure, recently, many agencies such as veterans affairs(VA),California legislature, have designated pain as a fifth vital signs, to be assessed at the same time as each of the other four.(**Barbara** *et al.*, 2012, kozier *et al.*, 2012& Smeltzer and Bare 2010). Pain reveals a lot about a person's health, which is why it is often called the fifth vital sign. Not only does pain affect a persons' physical health, but it also, affects their mental health and quality of life through things such as mood, activity, sleep, hygiene, appetite, and the ability to focus and concentrate. (JCAHO, 2009).

The American Pain Society, 2005, created the phrase "pain: the fifth vital sign" to increase awareness of the important of pain management ,not just in end of life care ,but for every patient .vital signs are routine & essential data gathered daily that influences the course of care. The routine use of pain assessment tools promotes heightened caregiver awareness about the patient's pain & provides a means of communication between physicians & nurses. (Mellar&Declan, 2004).

Various organization and regulatory bodies, including the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) have declared that pain should be treated as vital sign (Chapman, 2000). On November 11, 1995 James Campbell, MD, president of the American Pain Society, spoke about the importance of pain assessment and stated: "Vital signs are taken seriously. If pain were assessed with the same zeal as other vital signs are, it would have a much better chance of being treated properly, we need to train doctors and nurses to treat pain as a vital sign" (American Pain Society, 2003& Hansson et al., 2006).

Pain is the most common symptom reported by patients during their hospitalization experience.

Recent studies in geriatric literature indicate that anywhere from 50 to 80 percent of long-term care residents have acute and chronic pain that can cause depression, decreased socialization, sleep disturbances and decreased mobility. And while most older adults can tell their caregivers they are experiencing pain and be treated appropriately, adults who cannot verbalize how they are feeling run the risk of suffering in silence. (Quan, 2006& a publication of Riverview health centre, 2008).

An assessment of pain is often vital for good clinical care, judging the progress of patients and the efficacy of their treatment, and for arriving at proper diagnoses. Inconsistencies in pain assessment, on the other hand, can lead to patient suffering *(Bible, 2006)*. The most commonly used method to assess pain as a 5th vital sign is the 0 to 10 pain numeric rating scale(NRS),the NRS has robust psychometric properties in research application, but how the NRS perform in routine outpatient practice is less certain. (Veterans Administration Health Services Research, 2008, karl, 2008& Devi & Tang, 2008).

The applicability of daily pain assessment has been explored in several studies. It has been reported that when nurses are instructed to monitor pain on a daily basis, they find it useful and applicable to nursing practice (Scott 1994). Walker et al. (1987) studied the use of pain assessment charts in the management of chronic cancer pain, and found that 89% of the 37 nurses indicated that the chart was a valuable tool for pain assessment. However, evaluating the applicability of assessing pain in regular intervals by adding pain in the vital signs chart has not being explored widely yet, as a matter of fact only one study conducted by El-Fouly & Al-Moteerey, (2009) has investigated this issue by proposing five vital signs graphic chart. The study audited patients' chart to observe nurses' performance for the extent of applicability of pain assessment as a fifth vital sign. The study revealed full application of the new change by 95.0% of the nurses for the graphic part, and by 75.0% of them for the pain assessment part. In total, 75.0% of the nurses had full application of the change. Other study conducted by Masnsour et al. (2011) has investigated this issue by proposing five vital signs graphic chart. The study revealed full application of the new change by 72.8%. On the other hand, several studies revealed that pain recording by nurses in different healthcare settings is infrequent, and the use of pain scales is limited (Chanvei et al., 2004)

Recording deficits create difficulties to track patient pain and the effectiveness of the treatment plan, or to achieve good pain control or adjust treatment modalities for maximum pain relief (*Anderson et al.*, 2000). To overcome this, pain needs to be assessed and recorded regularly and consistently in integration with vital signs graphic chart as the fifth vital sign (*American Society of anesthesiology, 2004*).

Therefore, the present study objective was to apply the proposed five vital signs graphic chart in nursing practice at Assiut University Hospitals in attempt to generalize it. This was to be achieved through accomplishment of the following aims:

- 1. To audit the professional compliance of nurses with the proposed five vital signs graphic chart.
- 2. To obtain the opinion of nurses about using the proposed five vital signs graphic chart.

2. Subjects and Methods Study Design An exploratory descriptive study design was carried out for the present study. **Setting**

The study was conducted in multiple settings, with a heterogeneous population (General Surgery, Internal Medicine, Burn, Trauma and Orthopaedic Departments) at Assiut University Hospitals Egypt.

Subjects

All nurses who are working in the previously mentioned setting and available at the time of data collection were included in the study subject. Their number was 60 nurses.

Data collection tools

Four tools were used to collect data of the present study.

Tool (1)

• A structured interview questionnaire was designed to collect demographic data of the nurses including age, Sex, Occupation, years of experience, and Qualification.

Tool (2)

Nurses' opinionnaire scale developed by (EL-Fouly & Al-Moteerery, 2009) was used to assess nurses' opinions regarding the using of a proposed graphic chart for pain as fifth vital signs in nursing practice. This scale consisting of 20 items, divided into two sections: feasibility of the chart (8 items), effect of modified chart on quality of pain care (12 items). The response to each is on a 5-point Likert scale that ranges from 1 (strongly disagree) to 5 (strongly agree). A higher score is indicative of nurse's satisfaction with the new chart and agreement upon it. For each section, the scores of the items were summed-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a percent score. Nurse's opinion was considered "agree" if the percent score was 60% or more (corresponding to scores 4 and 5 on the scale for agree and strongly agree, respectively), and "disagree" if less than 60% (corresponding to uncertain, disagree, and strongly disagree). The scale content validity was done through experts' opinions, and its reliability was measured by Cronbach alpha coefficient, which turned to be 0.60, indicating good reliability for a newly developed tool.

Tool (3):

Audit sheet: This sheet was used to observe nurses' performance for the extent of applicability of pain assessment and graphic chart recording of the proposed nursing graphic chart for pain as a fifth vital sign. The sheet is divided into two sections; graphic charting (two items related to intensity and commitment to intended time) and pain assessment [six items related to intensity and PQRST acronym: P – provoking or precipitating factors, Q – quality of pain (what words does the person use to describe pain? – aching, throbbing), R – region of pain, S – severity of pain (intensity; 0-10), and T – timing (occasional, intermittent, constant)]. Each item was scored 1 to make a total maximum score of 8. For each section and for the total of the sheet, the nurse was considered to have fully performed it if the maximum score is attained, and not fully performed if one or more of the items was missed.

Tool (4):

A Proposed five vital signs graphic chart:

The proposed five vital signs graphic chart modified by El-Fouly& Al-Moteerey, (2009) was used to examine the applicability of adding pain assessment as a fifth vital signs. The chart consists of graphic record of patients vital signs such as pulse, temperature respiration & blood pressure, it also included additional part for pain assessment, this additional part is consisted of two section: first is the graphic section where pain intensity score or numerical rating scale (NRS) is charted as 0=(0) none, 1=(1-3) mild, 2=(4-1)6)moderate,3=(7-9)sever,&4=(10)worst. The second part consists of pain assessment parameters description, which is only recorded if pain is more than mild. The selected parameters are based on "PQRST" acronym (Precipitating or provoking factors, Quality, Region, Severity (intensity, 0-10) and Timing of pain). The proposed chart had its validity established based on literature review together with the opinions of a consultation group of pain assessment and management experts at King Khalid University Hospital.

Modified nursing vital signs graphic chart

The vital signs graphic chart was redesigned (annex I) by keeping vital signs part as is, and adding the pain assessment part.

Method of Data collection

- 1. Permission to conduct the study was taken from directory of faculty of nursing & hospital responsible authorities after explanation of the aim of the study.
- 2. Informed consent to participate in the study was obtained from all participants after clarification of the aims of the study and explanation of the way of applying the chart (tool 4) in a simple and clear manner. The modified nursing vital signs graphic chart and the data collection tools were developed and their content validation was based on literature review together with the opinions of a consultation group of pain assessment in staff of medical surgical nursing in faculty of nursing Assiut university
- 3. Prior to the pilot study conduction, nurses were trained in the use of the modified nursing vital signs graphic chart. A staff meeting was done under the supervision of the head nurse to clarify

the purpose, objectives and nature of the study as well as to explain the way of using the proposed chart. The pilot study was carried out for the purpose of testing clarity, applicability, and feasibility of the proposed chart and tools. Finalization of the tools was done based on pilot study findings. The subjects of the pilot were excluded from the main study sample.

- 4. Each nurse in the study subjects was interviewed individually to collect the necessary data and asked to fill out the proposed chart (tool 4) in not less than three days over day and night shifts till patient discharge.
- 5. Upon the completion and submission of the proposed chart (tool 4, nurses in the study subjects were asked to complete (tool 2 Nurses opinionnaire scale to assess their opinions regarding the applicability of a Proposed Graphic Chart for pain as Fifth Vital Sign in Nursing Practice. A higher score is indicative of nurse's satisfaction with the new chart and agreement upon it.
- 6. Completed proposed charts done by nurses were audited using tool 3 "Audit sheet" to evaluate nurses' compliance for the proposed five vital signs graphic chart. Nurses were considered to have a professional compliance if the percent score was 60% or more. A higher score is indicative of nurse's higher professional compliance

Ethics and human rights

An informed consent was obtained from all the participants before collecting any data. Explanation of the study aim in a simple and clear manner was done to each participant. No harmful maneuvers and no hazards were anticipated. All data were considered confidential. Participants were informed about their right to withdraw from the study at any time without giving any reason.

Statistical analysis

Data entry and statistical analysis were done using SPSS version 14.0 statistical software packages. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations and medians for quantitative variables. Cronbach alpha coefficient was calculated to assess the reliability of the developed tool through its internal consistency. Pearson correlation analysis was used for assessment of the inter-relationships among quantitative variables. Statistical significance was considered at p-value <0.05.

3. Results

Table (1) Showed number and percent distribution of nurses participating in the study according to their demographic characteristics, it was found that age of nurses participated in the study ranged between 20 and 49 years old with Mean \pm SD (27.85 \pm 7.82 years), majority of them 93.6% were females, about two third 65% of them had diploma of nursing qualification and (26.7%) of them had bachelor degree of nursing qualification, Their years of experience was ranged between 1 and 17 years, with Mean \pm SD (7.40 \pm 3.94 years), 72.3% of them are working staff nurse and 26.7% of them are working nursing supervisors, majority of them 85% didn't attend any training courses on pain and its management as well as have not any assessment pain scale.

 Table (1) Number and percent distribution of nurses related to their demographic characteristics

Variable	N =60	%		
Age				
20<	54	90%		
40-60 years	6	10%		
Means \pm SD	27.85	±7.82		
Sex				
Male	10	6.7%		
Female	50	93.3%		
Qualification				
Diploma Degree of Nursing	39	65%		
Technical Nursing Institute	5	8.3%		
Bachelor Degree in Nursing	16	26.7%		
Occupation	1	1.7%		
Nursing aids	43	72.3%		
Staff nurse	16	26%		
Nursing supervisor				
Years of Experience	7	11.7%		
less than one year	53	88.3%		
One year and more				
Means ±SD	7.40 ±	= 3.94		
Nurses attended in-service training	9	15%		
programs on pain	51	85%		
Nurses not attended in-service				
training programs on pain				
Nurses have pain assessment sheet	15	25%		

Table(2) illustrated nurses opinion about feasibility of the proposed nursing graphic chart for pain as a fifth vital sign, it was found that more than 60% of nurses reported (agree & strongly agree) about six out of eight items related to feasibility of using the proposal graphic chart for pain as a fifth vital signs. Regarding items of feasibility 63.4 % of nurses stated that it was easy to use, allowed to look for pain score during round, appropriate for frequently assessing pain intensity in the day and require were constituted in 65% of nurses. while 68.4% of nurses reported that during round, they always look at the recorded pain and recording of pain score in vital signs chart is useful.

 Table (3) Demonstrated nurses opinion about
 using the proposed nursing graphic chart for pain as a fifth vital sign and its quality of pain care, it was found that more than 60% of nurses reported (agree and strongly agree)about 11 items out of 12 items listed in the table. 73.3% of nurses stated that proposal graphic chart increases pain discussed during changed in shift than it used to be, 70% of nurses agree upon both statement that chart allows to Focus more on patient pain & Physicians make adequate use of the pain assessment, as well as 68.6% of them stated that the proposal graphic chart increases contact with patient. increases pain discuss between nurses & asking the patient for the pain in the present moment, and 66.6% of them reported that it Allows to intervene immediately when needed.

Table (2) Nurses opinion about feasibility of the proposed nursing graphic chart for pain as a fifth vital sign (N=60)

Nurses opinion about feasibility	(Disag	ngree ree and Disagree)	Unc	ertain	Agree (Agree and strongly agree)		
Items	N	%	Ν	%	Ν	%	
Not time consuming	19	31.7	7	11.6	34	56.7	
Easy to use	18	30	4	6.6	38	63.4	
Fits with nurse daily routine	22	36.6	6	10	32	53.4	
Allows to look for pain score during rounds	16	26.6	5	8.3	39	65.0	
During rounds, I always look at the recorded pain	14	23.3	5	8.3	41	68.4	
Recording of pain score in vital signs chart is useful.	14	23.3	5	8.3	41	68.4	
Appropriate for frequently assessing pain intensity in the day	15	25	6	10	39	65.0	
Require less effort for charting than other forms	19	31.6	2	3.3	39	65.0	

Nurses opinion about the proposed nursing graphic chart for pain		sagree agree and	Unc	ertain	Agree (agree and strongly agree)	
· · ·	· · · · · · · · · · · · · · · · · · ·	y Disagree)				
Items	Ν	%	Ν	%	Ν	%
Increases contact with patient	14	23.3	5	8.3	41	68.3
Increases pain discussed during changed in shift than it used tobe	16	26.6	0	0	44	73.3
Increases pain report in nursing record than it used to be	21	35.0	6	10	33	55.0
Increases pain discuss between nurses	14	23.3	5	8.3	41	68.3
Focuses more on patient pain	11	18.3	7	11.7	42	70.0
Ask the patient for the pain in the present moment	14	23.3	5	8.3	41	68.3
I consider asking for pain intensity at least once a day	17	28.4	7	11.7	36	60.0
appropriate.						
Physicians make adequate use of the pain assessment	12	20.0	6	10	42	70.0
Allows to intervene immediately when needed	14	23.3	6	10	40	66.6
Introduction of daily pain assessment ,nurses raise	12	20.0	9	15	39	65.0
Highlights the concept that pain is the fifth vital signs	14	23.4	9	15	37	61.7
In future I think, nurses should ask for a pain score each day.	12	20.0	10	16.7	38	63.3

Table (3) Nurses opinion about using the proposed nursing graphic chart for pain as a fifth vital sign and its quality of pain care (N=60).

Table (4) Total nurses' opinions about the proposed pain chart (N=60)

Variable Feasibility:	No=60	%
Agree	49	81.7%
Disagree	11	18.3%
Quality of pain care		
Agree	50	83.3%
Disagree	10	16.7%
Total opinion:		
Agree	50	83.3%
Disagree	10	16.7%

Table (4) noted nurses opinion about the proposed pain chart it was found that the majority of nurses were agreed the chart feasibility and its positive impact on quality of pain care (81.7%) and (83.3 %) respectively.

Table (4) showed audit findings of nurses succeed in using of the proposed pain chart, it was found that the percentages of nurses succeed in auditing of patients files changed from the first to the third recording in each item of the chart. In the first recording the percentages of nurses succeed was ranged from (81.7%) to (100%), in the second recording was (60%-98.3%) and in the third recording was (61.7%-91.7%). More than 60% of nurses were succeeded in audit findings of all related to proposed pain chart. Hundred percent of nurses were succeeded in audit the intensity of pain in the first recording compared to 80% of them in the third recording, 91.7% were succeeded in audit the severity of pain in the first recording compared to 70% of them in the third recording.

Table (5) Multi Infanigs of	nui ses succeeu m							
		First reco	ording	Second	recording	Third recording		
success			success					
A-graphic charting	Related to time	No	%	No	%	No	%	
56	93.3	4	44	73.3	38	63.3.		
Related to intensity	60	100		59	98.3	55	91.7	
Pain assessment parameter	Intensity	60	100	51	85	48	80	
Provoking factor	49		36		60	34	65.7	
Quality	51	84.5	40		66.7	38	63.3	
Region	53	87.9	40		66.7	37	61.7	
Severity	55	91.7	4	45	75	42	70	
Time	54	89.7	44		73.3	39	65	

4. Discussion

Assessing the pain can be administered quickly for most of patient in a routine basis. As with other vital signs a positive pain score should trigger further assessment of the pain, prompt intervention and follow up. The proposed graphic chart has been developed as a method of routinely assessment and recording to be used by health care professionals. It has been shown previously that using the proposed graphic chart for routinely pain assessment is applicable in clinical practice (El-Fouly & Al- Moteerey, 2009 & Mansour, Kamal, & Al- Mansour *et al.*, 2011). The professional compliance of applying the proposed graphic chart for routinely pain assessment in a clinical setting has not been studied in a heterogeneous population.

The present study investigated nurses' opinions and using of a proposed nursing graphic chart for pain as a fifth vital sign in clinical practice. The findings revealed have positive attitude among nurses towards daily pain assessment & the majority proved to be feasibility: recording of pain score in vital signs charting is useful ,during rounds, I always look at the recorded pain ,less effort than other form, ease to use & frequent assess pain intensity in the day as shown in table (2). In agreement with this, de Rond et al. (1999) stated that daily pain assessment was valued positively by nurses, and that a majority of them reported that daily pain assessment was feasible in clinical practice. and fitted in easily with their daily routine and quality care of pain Auditing also demonstrated a high level of performance of all tool items. These findings pointed to success of the new tool to be acceptable and applicable by the majority of the nurses. Other study was in agreement with the study of, Mansour et al. (2011): who stated that the majority of nurses were agree upon chart feasibility (74.5%), compared to about 81.7% in the present study.

Meanwhile, the feasibility items with lowest agreement among the present study nurses were related not time consuming and fit with nurse daily routine as shown in table (2). A similar finding was reported by *de Rond et al. (2001)* who demonstrated that around 30% of the nurses considered that pain assessment was too much time consuming, compared to about 32% in our study.

Regarding the quality of pain care, the present study indicated that the majority of nurses reported their agreement related to the new graphic chart is increase discuss during change in shift, focuses more on patient pain, increase contact with patient physician make adequate of pain assessment & increase pain discuss between nurses as shown in table (3). A similarity findings were reported by Mansour *et al.*(2011).

Who concluded that, the majority of nurses agreed that applying the proposal graphic chart high lights the concept that the pain is the fifth vital signs (86.4%), increase contact with patient & focuses more on patient pain. Other study in congruence with these foregoing present study findings, Harkreaderm and Hogan (2004) highlighted that the purpose of documentation of clients' care is communication amongst health team members. Therefore, pain charting would improve nurse-nurse communication. Additionally, de Rond et al. (2001) found that about 46% of nurses communicated more frequently with colleagues as a result of the daily pain assessment. Conversely, failure to record various pain aspects can form a real obstacle for nurses and other health care providers in care planning for patients in pain (Rosenquist and Rosenberg, 2003&Goldstein et al., 2004).

Results of the present study revealed that the majority of nurses reported their agreement (83.3%), about the feasibility & quality of pain care , pain as fifth vital signs improve quality of pain care as shown in table (4), this result resemblance finding was reported by **Al-Mateery** *et al.*(2009) and **Mansoure** *et al.*(2011)

Total opinion 72.8% & 87.5%) consequently. Almost all participant nurses agreed that the new chart improved the consistency of pain documentation and management as the new chart allows them routine and continuous assessment, immediate intervention, and follow-up.

The consistency of pain assessment identified in the present study nurses' opinions was further confirmed through auditing their utilization of the new chart. The results revealed high levels of performance 93.3% was for once daily assessment of pain as shown in table (5), these result are in accordance with the professional compliance of 96.6% &86.6% reported by De Rond et al. (1999) & Mansoure et al.(2011) however, the professional compliance gradually decreased to 63.3% after the first record . It might be explained by that there was a staff reduction in the evening shift, which meant that the second assessment was an extra burden for nurses working during the evening shift and probably led to decreased motivation, majority of nurses not attend any conference or seminar about pain leads to lack of knowledge about pain assessment & not found any form about pain in unit. In contrast, other studies reported poor quality of documentation (Chanvej et al., pain 2004; Abdalrahim et al., 2008). Several explanations were given for this poor performance, which included nurses' feeling that no one read or utilized the information they documented, insufficient knowledge and skills in documenting pain, shortage of ward nurses, lack of legislation and hospital policies that

emphasize the importance of using pain scales, and absence of well-established guidelines for pain assessment and management. All these constraints were taken into account in the development of the new chart of the present study, and also in the process of its implementation.

This suggests that it is very important to appraise beforehand the characteristics and resources of a potential hospital or nursing ward and the characteristics and requirements of the proposed innovation, as this might affect successful implementation (Varkey, *et al.*, 2008).

5. Conclusion and Recommendations

It is concluded that the proposed new modified chart for pain assessment is feasible, applicable, and has positive impact on quality of pain care. It allows continuous pain assessment in an objective manner providing the nurse the opportunity to assess pain with vital signs at the same time just by one look.

Therefore, it is recommended to apply the new chart on a wider scale to further confirm its feasibility and validity. Also, regular pain assessment as the fifth vital sign should integrated in patient care as a part of quality assurance. Nurses need to be accountable to improve their knowledge and skills in assessing pain, which necessitates implementing educational programs through in-service training and continuing nursing education. It is also necessary for hospitals to require nurses' notes on their charts for pain assessment and management.

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(Annex1) TEMPERATURE, PULSE, RESPIRATIION, BLOOD PRESSURE AND PAIN ASSESSMEN RECORD

			Ward;			ROOM NO; DEPT.						DAT	E;						
Pa	atient diagnosis;													-					
	Date																		
	Time	-																BP	
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de la	Mov.; inclu		shooting, burning, aching,									dicate	dura	tion			1 J		
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If pain >1 in graphic chart pain score	Cougi		num	-		1				L									
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	0 - (0) no	Pain		1-3) mi	Id		2 = (4-6) moderate pain				3 = (7-9) sever pain			4 = (10) the worst pain					
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2/20/2013