

**PHYSICIANS' PERCEPTIONS OF AND SATISFACTION WITH ORDER SET TYPES IN
A COMPUTERIZED PROVIDER ORDER ENTRY SYSTEM**

By

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CERTIFICATE OF APPROVAL

This is to certify that the Master's Capstone Project of

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ABSTRACT

Order sets have numerous advantages of standardizing clinical practice and improving efficiency, safety and physicians' acceptance of the computerized provider order entry (CPOE) system. Hospitals have adopted various strategies in developing different order set types. This study evaluates physicians' perceptions and satisfaction with the use of department, convenience and personal order set types. A survey instrument was developed based on the extended technology acceptance model (TAM2) to measure physicians' perceptions and attitudes towards different types of order sets. The survey was administered to physicians from different departments and job grades. Factors relating to perceived usefulness, ease of use and satisfaction were measured using a Likert scale. Respondents valued department order sets more than other order set types in terms of usefulness and ease of use. However, providing a variety of ordering templates and order set types with a greater emphasis on design of efficient evidence based order sets and end user training is necessary for CPOE implementation.

BACKGROUND

Computerized provider order entry (CPOE) is an integral part of a successful clinical information system. In CPOE, clinical users directly enter medications, laboratory and radiology orders into the computer. The computer system electronically transmits the orders to appropriate ancillary department, pharmacy or individual to carry out the order. CPOE provides numerous benefits in terms of patient safety such as ensuring legibility, completeness and accuracy of orders.^{1,2} It improves efficiency by allowing faster transmission of orders. Furthermore, CPOE provides an opportunity for hospitals to standardize processes and improve compliance to guidelines.³

Despite CPOE's numerous benefits, resistance towards its use is prevalent. Clinical end users often feel that additional workload and time are required with CPOE use.⁴ Order sets, which are collections of related orders, can improve efficiency and promote physician acceptance of CPOE.⁵ By using CPOE order sets, clinical users reduce time spent on individually entering orders and can easily place several related orders with a few keystrokes or mouse clicks. Furthermore, order sets have been regarded as an effective mode to deliver evidence based guidelines to the end users at the point of ordering.⁶ Evidence based order sets allow users to place a prepackaged group of orders that apply to a specific diagnosis or clinical setting. As they can be linked to patient specific information and driven by logic and automated calculators, order sets can reduce errors at the point of ordering.⁷

Hospitals have adopted varying strategies towards order set design. Many hospitals create a variety of standardized order sets that include disease specific type of order sets to the more general “quick orders”.⁵ Quick orders are ordering templates with predefined and default values that save provider time during ordering. Personal order sets, which are self-customized by clinicians provides them with flexibility. Hence, the personal order set has been regarded as an important aspect to promote physician acceptance of CPOE.

However, recent studies highlight the reality that the presence of order sets in the system does not guarantee clinicians will use them. This leads to a “you can lead a horse to water but you can't make him drink” phenomenon.⁶ Like a horse that cannot be forced to drink the water it is led to, a physician cannot be compelled to utilize evidence based order sets. This is evident from hospitals’ reports of varied order set use and physicians’ differing perceptions towards order sets.^{8,9} Some hospitals that implemented CPOE have reported limited use of disease specific departmental order sets especially in complex medical cases.^{7,8} Furthermore, there are also concerns over personal orders set deviating from standardized care.¹⁰

Many studies evaluated the frequency of various order set use and clinicians’ compliance to evidence based order sets. Some studies compare the use patterns of different ordering entities such as preconfigured quick orders and order sets.^{5,11} However, there are few and limited studies that evaluate factors associated with end users’ perceptions and use preferences of the different ordering entities and order set types.^{12,13} The technology acceptance model suggests that end user acceptance and use of a technology is influence by their perception of the technology usefulness and ease of use.¹⁴

Therefore, evaluating factors such as physicians' perceived satisfaction, perceived usefulness and perceived ease of use of order sets will be useful to understand use patterns.^{11,15}

OBJECTIVES

Two primary research questions guide this study: 1) How do physicians perceive the usefulness and ease of use of the different order set types? 2) What are the factors associated with physicians' perceived satisfaction and use of the different order set types? Measuring factors relating to physicians' perception and satisfaction of order sets use will be beneficial for future CPOE system design, development, implementation and training. This information may have implications for how CPOE order sets can be effectively designed and "marketed" for physician acceptance and use.¹²

MATERIALS AND METHODS

Study setting

The study was conducted at an 830 bed tertiary hospital with specialties such as obstetrics, gynecology, surgery and general medicine. It provides care in sub-specialized areas of oncology and neurosurgery. The hospital employs over 3000 employees, comprising of about 400 physicians and over a thousand nursing staff. It also serves as an academic training institution.

CPOE system and order sets

In 2009, the hospital began to implement a vendor-based inpatient CPOE system. The implementation of CPOE was carried out over three years in separate phases. The initial phase in 2009 involves implementing electronic medication prescribing. In October 2010, electronic ordering of laboratory and radiology investigations was implemented. One of the CPOE implementation strategies was to create CPOE order sets. The aims were to improve physician acceptance of CPOE and to standardize clinical practices. Order sets were developed by a team of informaticians, domain experts (physician clinical champions and senior doctors from various specialties) and pharmacists. Order sets were generally categorized into convenience order sets, disease specific departmental order sets and personal order sets.

Convenience order sets are predefined lists or groups of investigations or medications that are put together to facilitate ordering. The aim of convenience order sets is to provide physicians with efficiency and ease of accessing their desired orders. An example is a common X-ray order set that provide a quick access to various X-ray investigations (Figure 1 in Appendix). The common X-ray convenience order set was created to provide a single window for clinicians to easily enter multiple X-ray orders.

Departmental order sets are ordering templates developed in collaboration with domain experts from various specialties. Departmental order sets are either based on chief complaints or specific to diagnosis and conditions. They were created based on evidence based guidelines, clinical pathways and were reviewed by domain experts. These order sets generally have built-in clinical decision support such as disease specific treatment information and automated calculator for computing medication doses based on weight. Physicians were encouraged to make use of departmental order sets to place their orders.

An example is a urinary tract infection order set that the gynecologist could use to order medications and investigations for a woman with a urinary tract infection. (Figure 2 in Appendix)

Personal order sets provide clinical users with flexibility to create and customize their own personalized list of orders. Physicians can save their personalized lists and readily access them to place orders for any patient encounter. Personal order sets are only accessible by the physician who created them.

The entire order set development process took up to 6 months. Informaticians started by collecting preprinted paper order forms and protocols from various departments. These preprinted forms include collections of orders for postoperative care, admission protocols for specific diseases and evidence based protocols for conditions. Feedback and ideas were obtained from nurses, pharmacists and ancillaries who receive orders from physicians. Physicians from various specialties were consulted. They were responsible for editing and vetting order sets specific for their clinical domain. Past data from laboratory and radiology services pertaining to frequency of various investigations ordered by physicians were obtained. This aided in the creation of convenience order sets.

Physicians are required to enter all medications and diagnostic orders (laboratory and radiology investigations) in the CPOE system for all admitted patients. These orders may be entered individually in an “a la carte” manner or through any type of order set. To enter orders, the ordering physician either select individual orders via an alphanumeric search function, or he or she may call up an order set by name using the same search function.

Alternatively, he or she could use a hierarchical browse tree on the left side of the screen to search for the desired order. Orders submitted by physicians are electronically transmitted to pharmacy and ancillary departments for processing.

Study population

Physicians are the main users of the CPOE system. Physicians from the division of pediatric medicine, surgery and obstetrics and gynecology were selected for the survey as they are frequent users of the CPOE system. Because ordering by nurses is restricted to a limited list of laboratory investigations, we have excluded them from the survey.

Survey Instrument

The survey tool was designed to measure physicians' satisfaction, self-reported usage and perceptions of the three CPOE order set types. The survey questionnaire is divided into 3 segments to evaluate the three different types of order sets.

The survey instrument was developed based on the widely used extended technology acceptance model (TAM2) to measure physicians' attitudes and perceptions towards different types of order sets.^{16,17} TAM2 has been well tested and proven to be reliable in predicting user acceptance and intention to use an innovation.¹⁶⁻¹⁹ TAM2 asserts users' intention to accept and use a system is determined by two key factors: perceived usefulness and perceived ease of use.^{14,16} Perceived usefulness is defined by Davis as the extent to which user perceives that using the system would enhance his or her job performance. Perceived ease of use is the degree to which user perceives using a particular system would be free of effort.¹⁴

Perceived usefulness and perceived ease of use for different order set types are measured using measurement scale items adapted from TAM2.^{16,17} Minor modifications were made to measurement scale to fit the clinical context. This includes rewording of the questions and substituting the word “system” with order set. Questions that measure perceived usefulness include physicians’ perception of order sets impact on productivity, improving quality of care, enhancing effectiveness and usefulness in the physician work. As safety and standardizing care are considered potential benefits of order sets, two additional questions pertaining to care standardization and safety are included to measure perceived usefulness. Questions that measure perceived ease of use include physicians’ perception on whether 1) order sets are easy to use, 2) interaction does not require a lot of mental effort, 3) interaction is clear and understandable, 4) it is easy to get order sets to do what the physician desire.

Survey response was obtained based on a seven point Likert scale, where “1” corresponds to “strongly disagree”, “4” corresponds to “neutral” and “7” corresponds to “strongly agree”. Physicians were also asked to gauge their satisfaction and whether they enjoyed using the order sets. A self-reported score of order set use was ascertained in the survey. Furthermore, there are open ended questions to obtain feedback from physicians that may not be reflected by the standardized questions.

The survey questionnaire contains an introduction and simple instructions to explain the three orders set types in the CPOE system. The survey responses were anonymous and respondents were told that no individual will be identified in this study. However, some demographic data such as gender, department, and position were obtained to facilitate analysis. Respondents were also asked whether they have attended prior CPOE training.

Procedure

The survey was initially administered and tested by three physicians to assess the validity. The physicians were asked to feedback and comment on whether the survey questions were understandable and valid. Questions were changed to simple tense based on the physicians' feedback that it is more comprehensible.

An anonymous survey was administered to physicians from the department of surgery, pediatric medicine and obstetrics and gynecology. The surveys were sent to doctors of different grades, ranging from house officers and residents to attending physicians. To ensure that most physicians are already familiar with the CPOE system, the survey was administered six months after the implementation. The questionnaires were distributed at department meetings and sent to physicians via electronic mail. Survey responses were collected and aggregated on a spreadsheet and SPSS for analysis.

RESULTS

Demographics

The survey was sent to 186 physicians over a period of two months. 41 out of the 186 physicians (22%) responded to the survey. 28 (68.3%) of the respondents were female physicians. 56.1% of the respondents were from the department of pediatric medicine. Respondents from general surgery and obstetrics and gynecology comprise of 9.8% and 34.1% respectively of all respondents.

The majority of the respondents were junior physicians. There were 8 house officers (19.5%) and 24 medical officers (58.5%) that responded to the survey. 9 senior physicians, consisting of 3 registrar and 6 consultants participated in the survey. 34 of all respondents (82.9%) have attended prior formal CPOE training.

Descriptive statistics

Respondents generally rated the standardized department order sets higher in terms of perceived usefulness (PU), perceived ease of use (PEOU) and perceived satisfaction ($p < 0.01$). Personal order sets fare the worst among the three order sets types in terms of PEOU and PU. For PU, department order sets has an average mean score of 5.59. Convenience order sets and personal order sets have a mean PU score of 5.03 and 4.96 respectively. Mean PEOU scores for department order sets, convenience order sets and personal order sets are 5.58, 5.23 and 4.90 respectively. Respondents rated that they were more satisfied with department order sets and use them more frequently than convenience and personal order sets.

Perceived usefulness

For personal and convenience order set types, improvement to productivity, effectiveness and usefulness in daily work are rated higher than perceived benefits to quality, standardized care and safety. Mean scores for perceived usefulness in terms of productivity, effectiveness and usefulness in job are above 5.0, while mean scores for quality, standardized care and safety are below 5.0. (Table 1)

For department order sets, the mean scores for different PU questions are above 5.0 and generally higher than the mean scores for personal and convenience order sets.

Usefulness to job, productivity and standardization of care are scored higher than effectiveness, quality and safety for department order sets ($p < 0.001$)

| Mean scores of PU questions for different order sets types | | | |
|---|------------|-------------|----------|
| | Department | Convenience | Personal |
| Productivity | 5.68 | 5.20 | 5.24 |
| Quality of care | 5.39 | 4.95 | 4.90 |
| Effectiveness | 5.59 | 5.10 | 5.12 |
| Useful in job | 5.76 | 5.17 | 5.10 |
| Safety | 5.49 | 4.95 | 4.76 |
| Standardization | 5.63 | 4.83 | 4.61 |

Highlighted scores represent the top 3 scores for PU questions

Table 1: Mean scores of perceived usefulness questions of different order sets types

Perceived ease of use

The mean scores of the PEOU questions for department order sets are generally higher than the scores for convenience and personal order sets types. For department order sets and personal order set types, mean scores relating to easy to order what I want and easy to use are higher than scores for other PEOU items. However, for convenience order set type, the PEOU item relating to easy to place desired orders is ranked lower among the PEOU items. For personal order set type, the PEOU items for easy to use, mental effort and clear interaction are scored below 5.0, with respondents giving a low score of 1 for some PEOU items. (Table 2)

| Mean scores for PEOU questions of different order sets types | | | |
|---|------------|-------------|----------|
| | Department | Convenience | Personal |
| Easy to use | 5.63 | 5.27 | 4.90 |
| Easy to order what I want | 5.63 | 5.20 | 5.02 |
| Does not require mental effort | 5.61 | 5.20 | 4.88 |
| Interaction is clear | 5.44 | 5.24 | 4.80 |

Highlighted scores represent the top 2 scores for PU questions

Table 2: Mean scores for perceived ease of use questions of different order sets types

Frequency of use and perceived satisfaction

There was a wide range of self-reported use of the various order sets type. The frequency of use score ranged from 1 to 7 for department and personal order sets, and ranged from 1 to 6 for convenience order sets. The mean score for department order sets is 5.27, which is higher than convenience and personal order sets types (Table 3). Respondents rated a higher satisfaction score for department order sets than personal and convenience order set types. The perceived satisfaction score is 5.48 for department order sets types. While both personal and convenience order set types have a mean score of 4.96.

Pearson's correlation coefficients were calculated using bivariate correlations for both perceived satisfaction and self-reported frequency of use and is significant at the 0.01 level. Frequency of order set use is closely associated and positively correlated to users' satisfaction.

| Mean scores for frequency and perceived satisfaction of different order sets types | | | |
|--|-----------|------------------------|--------------------------------|
| | Frequency | Perceived Satisfaction | Pearson's coefficient/ p value |
| Department | 5.27 | 5.48 | 0.86 / <0.01 |
| Convenience | 4.41 | 4.96 | 0.86 / <0.01 |
| Personal | 4.07 | 4.96 | 0.62 / <0.01 |

Table 3: Mean scores for self-reported frequency and perceived satisfaction of the different order sets types

Scale reliability

To assess the consistency and reliability of the measurements, Cronbach's alpha coefficients were calculated for all the scales used to measure PU, PEOU and perceived satisfaction. All values were above the acceptable range of 0.70. (Table 4)

| Reliability of scale for PU, PEOU, perceived satisfaction (Cronbach's alpha) | | | |
|---|------------|-------------|----------|
| | Department | Convenience | Personal |
| Perceived usefulness | 0.93 | 0.94 | 0.94 |
| Perceived ease of use | 0.88 | 0.95 | 0.97 |
| Perceived satisfaction | 0.95 | 0.87 | 0.91 |

Table 4: Cronbach's alpha coefficients for the different measurement scales

Demographics correlations

Demographic variables (gender, designation, department, and training attendance) are compared to PU, PEOU, perceived satisfaction and frequency of use for all order sets types using T tests and ANOVA statistical methods. In general, PU, PEOU and perceived satisfaction and frequency of order sets use are not correlated to gender and department. Respondents who did not attend CPOE training rated a lower mean score of 3.17 for frequency of personal order sets use as compared to respondents who attended training that rated a mean score of 4.23.

Perceived usefulness, ease of use, satisfaction and frequency of use of departments order sets is related to designation of the physicians. Senior physicians (registrars and consultants) rated department order sets usefulness, ease of use and frequency of use higher than junior physicians ($p < 0.05$). The mean scores for PU, PEOU, perceived satisfaction and frequency of use rated by senior physicians are above 6. Junior doctors however rated a lower mean score of less than 6 for department order sets. Senior physicians are significantly more satisfied with the use of department order sets for placing CPOE orders ($p < 0.01$). (Table 5)

| Mean scores for department order sets based on physician designation | | | |
|---|------------------|------------------|-----------------|
| | Senior physician | Junior physician | Significance, p |
| Perceived usefulness | 6.28 | 5.4 | < 0.05 |
| Perceived ease of use | 6.14 | 5.42 | < 0.05 |
| Perceived satisfaction | 6.33 | 5.23 | < 0.01 |
| Frequency of use | 6.11 | 5.03 | < 0.05 |

Table 5: Mean scores for department order sets based on physician designation

Qualitative Results

Qualitative responses on order sets are varied with comments centered around three major themes. This includes usefulness and clinical applicability, training and learnability of order sets, and maintenance of evidence based order sets.

One of the major themes is on the order sets usefulness and clinical applicability. One respondent commented different department order sets varies in their usefulness. The respondent described drawbacks of limited usefulness in department order sets that are not adequately specific, citing an example of general surgery order sets that are mostly approach based and not as useful as more specific medical order sets. Conversely, another respondent commented that there is limited use of order sets as investigations and medication orders vary between patients. He commented that laboratory investigations should be decided on per patient basis and not everyone will need the same laboratory investigations.

A recurring theme in the qualitative response is training and learnability of order sets. One respondent commented on a need to improve teaching in usage of convenience order sets. Three respondents commented that they had difficulty with customization of personal order sets. Main reasons were them being unaware and unsure on how to do so. Two of the three respondents who encountered difficulties with personal orders did not

attend formal CPOE training. There is no feedback pertaining to the awareness and learning on the use of department order sets.

Another theme in the qualitative responses is regarding maintenance of the evidence based department order sets. One respondent commented on the urgent need to review cervical smears and investigations on the gynecology order sets. Another respondent recommended changes to investigations on a pediatric order set.

DISCUSSION

Perceived impact to productivity and efficiency are known barriers to CPOE implementation. Studies have identified decrease productivity as one of the major concerns that physicians have with the use of CPOE.^{4,20,21,30} Despite the known benefits of CPOE order sets, physician's perceptions of usefulness and their satisfaction of order set were more focused on productivity concerns. One possible explanation of this is that productivity and effectiveness of order sets use in their daily work are more apparent and noticeable. Physicians will easily value the benefits of order set if the order set could efficiently allow him to make all the required orders in a few mouse clicks, as compared to the painstaking process of entering orders individually in an "a la carte" manner. Conversely, error prevention and quality improvement may not be immediately apparent and physicians may not directly associate them with the use of order sets. As our study was conducted only months after implementation, physicians may also be more concerned about productivity factors in day to day practice than the long term usefulness in aspects of safety and quality of care. Error prevention with CPOE gradually improves overtime.^{22,23} A follow up study

may be useful to evaluate physicians' perceptions and value changes towards order sets in aspects of improving care and safety.

Convenience order sets and personal order sets, that are thought to be critical components in a successful CPOE implementation^{5,10}, were less perceived by the physicians to be useful and easy to use than department order sets. One possible explanation is that personal order sets require the physician to self-customize and preset a favorite list of medications. In the CPOE system, this customization requires more in-depth knowledge and more complex steps to be performed by the users. Physicians may not be aware or adequately trained in the customization and use of personal order sets. Convenience order sets may have provided a quick way for physicians to access common orders. However, they may not be adequately specific and appropriately tailored to meet the needs of a varied medical case. Furthermore, the convenience order sets may have presented too many options that were "irrelevant" to physicians on one screen, thus requiring users to browse through numerous relatively less useful options to locate the necessary one.²⁴ This may have resulted in poorer satisfaction and ease of use scores as compared to the more specific department order sets.

Department order sets generally had better satisfaction scores and were perceived by physicians to be the more useful and easy to use order sets type. However, there were still negative responses by some respondents. Conversely, for personal and convenience order sets that were seemingly less valued than department order sets, have high scores for perceived usefulness, ease of use and frequency of use given by some physicians. We conclude that there may not be a "one size fit all" strategy to implementing order sets types for a CPOE system. A study by Thomas et al. concluded that personal order sets despite its

drawbacks of non-adherence to best practices, played a significant role to improving user acceptance to CPOE.¹⁰ Implementers of CPOE systems may consider providing a variety of ordering templates and order set types⁵ with a greater focus and emphasis placed on design of better and more efficient department order sets.

Standardization of clinical practice has been discussed in many studies as one of the strengths and benefits of evidence based order sets.^{6,25-27} In our study, standardization of care was perceived as one of the main factors pertaining to the usefulness of department order sets. However, the challenge of using order sets to standardize practice is the need for constant updates of order sets to current evidence.⁶ For many healthcare organizations, maintenance and order set updates are time consuming, labor intensive and at times technically challenging. From our qualitative results, physicians also communicated a need for updates and changes to some order sets. It is hence necessary for healthcare organizations to devote a considerable amount of effort to the maintenance and clinical review of evidence based order sets to ensure their usefulness value still persist post CPOE implementation. A failure to do so may also result in a practice of outdated medicine on a widespread basis.⁶

The importance of adequate end user training was frequently discussed in many studies on CPOE implementation. It was identified as a crucial factor to improve user acceptance, satisfaction and use of the CPOE system.^{4,25,29,30} In our study, inadequacy in physician training has resulted in poorer satisfaction of personal order sets use. A few physicians who did not attend CPOE training were not even aware of the possibilities of personal order set customizations. Hence, formal CPOE training is essential not only to

provide the basic competency physicians require for daily use of the system but also to make them aware of the numerous possibilities and complex functionalities that the software provides.²⁸ It is preferable that implementers using personal order sets in a CPOE system ensure adequate emphasis is placed in training and communication as personal order set use may be technically more complex and not easily apparent from users' self-exploration of the software.

Pre-implementation physician engagement and involvement helps to improve subsequent acceptance and perceptions of the CPOE system.^{4,30,31} We realized from our study that senior physicians gave better satisfaction scores and had more favorable perceptions of department order sets. One possible explanation is that there were more engagement and involvement of senior physicians in the development of department order sets. Furthermore, most of the physician clinical champions were senior doctors. For many specialties, numerous feedback and consensus of senior physicians were obtained in the content development of the department order sets. Therefore, physicians were likely more satisfied using order sets that they agree with. This led us to a question on whether a more extensive involvement of junior physicians in order set development and CPOE implementation will result in better overall physician satisfaction, which hopefully could be addressed in further studies.

The main limitations of this study are its small sample size and limited follow up. Subsequent studies could be performed to evaluate how physicians' perceptions and satisfaction change over time. Future work could also be done on a larger scale and possibly in a multi hospital setting.

CONCLUSION

Implementers of CPOE have adopted different strategies and designs for ordering templates and order sets. However, there are few studies that evaluate and analyze factors associated with physicians' perceptions and use preferences of the different ordering entities and order set types. This study uses a cross sectional survey to evaluate physicians' perceptions of and satisfaction with different order set types. We adopted a modified TAM2 model to assess perceived usefulness, ease of use and satisfaction of department, convenience and personal order set types.

We conclude that physicians' perceptions of usefulness and their satisfaction of order set were generally more focused on productivity concerns and less on safety and quality of care. Department order sets are generally more valued than personal and convenience order sets in terms of usefulness and ease of use. However, there may not be a "one size fit all" strategy to implementing order sets for a CPOE system. It is preferable that implementers of CPOE systems provide the variety of ordering templates and order set types with a greater focus and emphasis placed on design of efficient evidence based order sets. Adequate end user training, constant evidence based order set updates and physician engagement are possible strategies to improve physicians' perceptions and satisfaction of CPOE order sets.

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APPENDICES

Figure 1: A convenience order set with a template of common X-rays for orthopedics use

The screenshot displays a medical order set interface for orthopedics. It features several sections with checkboxes for selecting different X-ray views:

- Spino-pelvic:** Cervical Spine X-ray, AP and Lat; Lumbar Spine X-ray - AP and lateral; Lumbar Spine X-ray, AP, Lat, Obliques; Lumbar Spine X-ray, Other views (specify); Pelvis X-ray, AP; Pelvis X-ray, Other Views (Specify); Spine X-ray, Thoracic spine, AP and Lat.
- Upper Extremities Right:** Shoulder X-ray, Right, AP and Lat (Y-Scapular); Elbow X-ray, Right, AP and Lateral; Humerus X-ray, Right, AP and Lateral; Radius/Ulna (Forearm) X-ray, Right, AP and Lateral; Wrist X-ray Right, PA and Lateral; Hand X-ray Right, PA and Oblique; Hand X-ray Right, Lateral.
- Upper Extremities Bilateral:** Shoulder X-ray, Both, AP and Lat (Y-Scapula); Elbows X-ray, Both, AP and Lat; Humeri X-ray, Both, AP and Lateral; Radius/Ulna (Forearm) X-ray, Both, AP and Lateral; Wrist X-ray Both, PA and Lateral; Hand X-ray Both, DP and Oblique; Hand X-ray Both, Lateral.
- Upper Extremities Left:** Shoulder X-ray, Left, AP and Lat (Y-Scapula); Elbow X-ray, Left, AP and Lateral; Humerus X-ray, Left, AP and Lateral; Radius/Ulna (Forearm) X-ray, Left, AP and Lateral; Wrist X-ray Left, PA and Lateral; Hand X-ray Left, PA and Oblique; Hand X-ray Left, Lateral.
- Lower Extremities Right:** Hip X-ray, Right, AP and Lat; Femur X-ray, Right, AP and Lateral; Knee X-ray, Right, AP and Lat; Knee X-ray, Right, Skyline View; Tibia Fibula X-ray, Right, AP and Lateral; Ankle X-ray, Right, AP and Lateral; Calcaneum X-ray, Right, Axial and Lateral; Calcaneum X-ray, Right, Broden's View.
- Lower Extremities Bilateral:** Hips X-ray, Both, AP and Frog-Leg; Femora X-ray, Both, AP and Lateral; Knees X-ray, Both, AP and Lat; Knees X-ray, Both, Skyline View; Tibiae Fibulae X-ray, Both, AP and Lateral; Ankles X-ray, Both, AP and Lateral; Calcanei X-ray, Both, Axial and Lateral; Calcanei X-ray, Both, Broden's View.
- Lower Extremities Left:** Hip X-ray, Left, AP and Lat; Femur X-ray, Left, AP and Lateral; Knee X-ray, Left, AP and Lat; Knee X-ray, Left, Skyline View; Tibia Fibula X-ray, Left, AP and Lateral; Ankle X-ray, Left, AP and Lateral; Calcaneum X-ray, Left, Axial and Lateral; Calcaneum X-ray, Left, Broden's View.

Figure 2: A department order set for managing a urinary tract infection.

The screenshot displays a medical order set interface for managing a urinary tract infection (UTI). It includes the following sections:

- Combined Measurements:** Height (cm) 150, Weight (kg) 50, BSA 1.44, BMI 22.2. Dates: 01-Feb-2012 10:36, 19-Aug-2012 03:48.
- UTI/Pyelonephritis:** Selected condition.
- Requested Date:** 21-Feb-2013.
- Relevant History/Findings/Prev Surgery:** Empty field.
- Priority of Test (Laboratory):** Routine.
- Priority of Exam (Radiology):** Routine.
- Is Patient Pregnant?:** Routine.
- Laboratory:**
 - Full Blood Count
 - C-Reactive Protein, serum
 - Renal Panel (U/E/BICARB/CRE), serum
 - Unanalysis
 - Urine Culture
 - Urine Phase Contrast
- Radiology:**
 - KUB X-ray
 - US Kidneys and Bladder
 - CT KUB (Non Contrast)
- Medication List:**

| Medication Name | Start Date | Order Priority | Route | Dose | UDM | Calc Dose Info | Frequency | Order Details/Instructions |
|--|------------|----------------|-------|------|--------|----------------|-----------|----------------------------|
| <input type="checkbox"/> Citravesscent Oral Powder | T | Routine | PO | 1 | sachet | | TDS | |
| <input type="checkbox"/> Amoxicillin Capsule | T | Routine | PO | 500 | mg | | TDS | |
| <input type="checkbox"/> CellULOxime Tablet | T | Routine | PO | 250 | mg | | BD | |
| <input type="checkbox"/> Cefalexin Capsule | T | Routine | PO | 500 | mg | | TDS | |
| <input type="checkbox"/> Ciprofloxacin Tablet | T | Routine | PO | 500 | mg | | BD | |
| <input type="checkbox"/> Co-trimoxazole Tablet | T | Routine | PO | 960 | mg | | BD | |
| <input type="checkbox"/> Nitrofurantoin Tablet | T | Routine | PO | 100 | mg | | QDS | |