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# **Prevalence and Quality of Clinical Pathways in Swedish Intensive Care Units: A National Survey**

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## **Keywords:**

Clinical Pathways, Standardized Care Plans, Intensive Care, Evidence-Based Practice,  
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## **SUMMARY**

**Aims** To identify the prevalence of Clinical Pathways (CPs) in Swedish Intensive Care Units (ICUs) and to explore the quality, content and evidence base of the documents in use.

**Methods** A descriptive and explorative survey of all Swedish ICUs (N84) and a review of submitted examples of CPs (n12) were conducted.

**Results** CPs were in use at 20% of the Swedish ICUs. There was a significant geographic variation but no relationships between the use of CPs and category of hospital, type of ICU, size of ICU or type of health record applied. In total, 56 CPs were reported, within a range of scopes and extensions. The content of the ICUs' CPs as well as the degree to which they were interprofessional, evidence based and renewed varied.

**Conclusions** Progress has been made in relation to CPs in recent years but there is potential for further improvements. None of the ICUs had CPs that contained all key-characteristics of a high quality, interprofessional and evidence based CP identified in the literature. Greater knowledge sharing and cooperation within the field would be beneficial and further research is needed.

## INTRODUCTION

Scientific knowledge is being developed at an ever quickening pace, yet there is a research-practice gap, a limited use of scientific knowledge in clinical practice, whereby patients may not be obtaining the highest quality care (1-3). Health care professionals are obliged to work according to evidence based practice, which implies basing clinical decisions on integrated knowledge from the best available science, clinical experience, contextual circumstances and patients' requirements (4-6). This can be challenging in clinical contexts where complex problems involve series of related actions and decisions (3, 7). Due to advances in understanding pathophysiology, innovations in supportive technology and an aging population, the field of intensive care is expanding in all western countries, at a high cost (8). The daily care of critically ill patients at intensive care units (ICUs) is complex, requiring integrated skills from numerous different specialties and teamwork is crucial for optimal outcome (9). In this context protocol-based care can provide a useful support to health care professionals, facilitate evidence based practice, improve patient care, reduce time with mechanical ventilation, decrease length of stay and imply cost savings (10-15). However, since the development and use of care-protocols differ between settings and countries there is a need for international knowledge sharing with regards to development, implementation, and evaluation of the phenomenon (7, 16-20).

Protocol-based care is the umbrella term for the use of documents to standardize health care delivery aiming to facilitate collaborative, integrated and improved patient-centered care, based on best available evidence (7, 21). Care-protocols, as clinical pathways, critical pathways, integrated care pathways and collaborative care plans, have been used worldwide since the 1980s but terminology and definitions differ between settings and countries (16-18, 22). In Europe, the concept 'clinical pathway'(CP) is commonly used, defined by Kinsman and colleagues as: (i) a structured multidisciplinary plan of care; (ii) used to translate guidelines or evidence into local structures; (iii) detailing the steps in a course of treatment or care in a plan, pathway, algorithm, guideline, protocol or other inventory actions; (iv) having timeframes or criteria-based progression; and (v) aiming to standardize care for a specific clinical problem, procedure or episode of healthcare in a specific population. Furthermore, Kinsman et al. 2010 argue that other concepts could be comparable with CPs if they meet the first and at least three out of the other four criteria (18). In Sweden the concept

'Standardiserade vårdplaner', which literally could be translated to Standardized Care Plans (SCPs), has been used since the 1990s. Initially the SCPs were delimited to nursing but in recent years developments have moved towards interprofessional development and use (12, 23-26). The Swedish National Board of Health and Welfare define a SCP as "a care and welfare plan that has been decided upon in advance based on a systematically developed knowledge base, describing recommended health care actions for specific health problems" (27) [author's translation]. The SCPs are to be used as a decision support tool by the interprofessional team and should be documented in the individual patient's health record. A related document, referred to as 'knowledgebase', displays the guidelines for using the SCP and the evidence of the recommendations made (23). Based on the characteristics of Swedish SCPs the concept can be comparable with CPs, according to the criteria suggested by Kinsman et al (18). Henceforth, the term 'CP' is used as an analogue of SCP and all other comparable concepts.

Many individual studies report how CPs have improved patient outcomes, reduced length of stays, enhanced teamwork and record keeping (7, 19, 28, 29) and a recent Cochrane review concludes that the use of CPs is associated with reduced in hospital complications and improved documentation. Further they report that most studies display decreased length of stay and reduction of hospital cost (19). An extensive review of literature regarding a spectrum of protocol-based concepts and evidence based practice (5, 18, 20, 23, 26,27, 29-33) reveals some key-characteristics applicable to a high quality, interprofessional and evidence based CP, summarized in Table 1.

There is a general impression that the use of CPs is increasing. However, a previous survey within Swedish in-hospital somatic care in 2005, revealed a lack of knowledge about CPs, an insufficient interprofessional approach and a poor scientific evidence base, raising a question about the quality of the documents (32, 33). Very little is known about the situation of CPs within Swedish ICUs. It is known that CPs are used but the extent of their use and in what format or from what evidence base is unknown. A better overview of this would offer a basis for directing future projects and cooperation within the field.

The aims of the present study were to identify the prevalence of CPs in Swedish ICUs and to explore the quality, content and evidence base of the documents in use.

## **METHODS**

### **Study design**

The study was conducted using a descriptive and explorative national total survey of all Swedish ICUs. A questionnaire was sent to the ICUs and submitted CPs together with their related knowledgebase was reviewed.

### **Setting**

Swedish ICUs provided the study setting. Sweden has about 9.4 million inhabitants and health care is largely publicly founded. The ICUs are distributed across six health care regions. Different categories of hospitals provide different levels of intensive care. *University hospitals* offer highly specialized care and general as well as specialized ICUs that provide the most advanced diagnostic and interventional technology available for different types of organ failure. *County hospitals* have a large number of clinical experts and general ICUs that master failures in most organ systems, but patients in need of more specialized care are remitted to the university hospitals. *Local hospitals* cover basic inpatient specialties and have small ICUs that are able to master failures in some organ systems, but patients in need of more advanced care are remitted to the county hospital (34, 35). ICU professionals include *physicians* specialized in anesthesiology and intensive care medicine, *registered nurses* (RNs) with specialist education within intensive care, *assistant nurses* and *physiotherapists*. Physicians from the patient clinics are involved in the care but are not stationed at the ICU while other medical professionals are available as consults (34). Care organization and the utilization of information systems are self-governed locally (35). Authorized health care professionals are by law obliged to document planned and given care in the patient's health record (36) but the use of electronic versus paper based health records varies between as well as within county councils.

### **Data collection and sample**

A study-specific questionnaire was created by two of the authors (PBS, IJ) based on an extensive review of the literature and expertise in the domains of ICUs and CPs. The Swedish national definition of CPs was stated (27) and the questions covered: the respondents' assignment and characteristics of the unit (6 items); the extent and development of CPs (6 items); content and formation of the CPs and sources of evidence utilized (7 items). The

questions were mainly multiple choices, closed response options with the possibility of providing free text. Prior to the study face validity of the questionnaire was tested by seven RNs from five different units at three different hospitals. The RNs were asked to fill in the questionnaire and additional questions about comprehension and time expenditure. Based on the RNs' answers some minor adjustments were made regarding the wording of the questions.

Data collection was carried out during November 2011 to January 2012. The questionnaire, together with a cover letter explaining the objectives and conditions of the study and a pre-paid envelope, were sent to the head of department at each ICU (N84) that was listed by the Swedish Intensive Care Registry (37). The head of departments were asked to answer the questions themselves or to delegate this to another key-informant. They were also asked to submit one example of the unit's CPs with the related knowledgebase. Two telephone reminders were made at three and seven weeks, and respondents were given the option to answer the questionnaire directly over the telephone. The response rate was 100% (N84), including 19 telephone respondents. The respondents representing the respective ICUs were: head of the department (n46), RNs assigned as development/ education/ documentation coordinators (n28), RNs without special assignment (n7), physician (n1) and administrator (n1). The ICUs with self-reported CPs that did not submit an example together with the questionnaire were first reminded by e-mail and then by telephone, resulting in examples from 71% of the potential ICUs.

The submitted CPs with related knowledgebases was reviewed using the audit protocols from a previously conducted survey (32, 33). The protocols covered the domains: content, structure, evidence base and renewal. A complementary study-specific protocol was used, specifying the amount of different sources of evidence that were utilized, the development process and the interprofessional approach. The review-process was conducted by two of the authors (PBS, IJ) independently of each other and thereafter compared. Where the assessments diverged a discussion took place until consensus was reached.

### **Data analysis**

All quantitative data from the questionnaire and the review were processed to generate descriptive statistics, using Statistical Package of Social Science version 19.0.0 (IBM SPSS

Statistics, NY, US). The characteristics of the ICUs and the use of CPs were cross-tabulated and Chi-square tested with exact significance (2-sided) due to the small sample size. Due to few cases in some of the six health care regions, they were collapsed into two categories (North, Uppsala-Örebro and Stockholm-Gotland versus South-east, West and South) during the analysis process. Statistical significance was set at  $p < 0.05$ . Free text answers and comments were summarized and the authors' perceptions were compiled. The merged data were interpreted on the basis of the key-characteristics of a high quality, interprofessional and evidence based CP, displayed in Table 1.

### **Ethics**

The study follows Swedish regulations regarding approval by the Regional Ethics Committee. Participation in the study was voluntary and all data were handled and stored to ensure confidentiality.

## **RESULTS**

CPs were in use at 17 (20%) of the 84 Swedish ICUs. An additional 13 (15%) ICUs reported ongoing projects or plans to implement CPs within the near future and 31 (37%) ICUs reported thoughts of implementing CPs but had no concrete plans. The characteristics of the ICUs are displayed in Table 2. There was significant differences between the southern and northern regions regarding the use of CPs ( $\chi^2 [84,1] 5.53, p .028$ ) but no relationships between the use of CPs and category of hospital, type of ICU, size of ICU or type of health record applied. The period since the ICUs currently using CPs implemented their first CP ranged between 1 and 12 years (Md 3, IQR 5), Figure 1.

In total 56 CPs were reported from the 17 ICUs using CPs (1-11 CPs/ICU, Md 2, IQR 1). The scope of the CPs vary from extensive, including most of the ICU-patient care to limited, including only one specific nursing area, e.g. how to fasten the tracheal tube. The titles of the reported CPs indicate inclusion of medical as well as nursing activity for a variety of health issues, see Table 3. Seven of the 17 ICUs stated that their CPs cover solely the patients' time at the ICU and the remaining 10 that one or more of their CPs cover also some other part of the patient's in-hospital care path. None of the ICUs used CPs that included the out-hospital aftercare. Other reported characteristics of the units' CPs are displayed in Table 4.

### **Review of submitted CPs with related knowledgebase**

Documents for the review were submitted by 12 (71%) of the 17 ICUs with self-reported use of CPs. The characteristics of the ICUs are displayed in Table 2 and the findings from the review are displayed in Table 5. Seven of the 12 documents address both nurses and physicians but the study revealed an insufficient clarification of responsible profession and time for the intervention and outcome assessment. The structure in the documents made it possible to relate the interventions suggested in the CP to the related knowledgebase in nine of the 12 documents. Two CPs contained interventions that were not explained in the knowledgebase and one document was not possible to assess due to an incomplete health record excerpt.

The evidence base varied across the reviewed documents. *Scientific knowledge* was to some extent utilized in all the documents. In seven of the 12 documents it was declared that a systematic review had been conducted and of these, two declared that the included articles were quality assured. In two additional documents, the number and relevance of the references indicated that a systematic review could have been performed without declaring the method. PubMed, Cochrane and Cinahl were the most commonly used databases, and the number of search terms used ranged between eight and 134 (Md 14), including both medical and nursing areas. All documents had references present in the text (Md 32, range 3-176), with research articles as the most common source. Seven of the 12 documents had a correctly reproduced reference list and the remaining three had references in the text that were not displayed in the reference list or references in the list that were not found in the text. *Clinical experience* and *contextual circumstances* were found in five and four of the 12 documents respectively. References concerning *patient's preferences* were found in five documents but the utilization of local experiences from patients'/ relatives' were absent.

The reviewed documents were developed or most recently renewed between 2008-2011 and were consequently 0-3 years old at the time of data collection. Six of the 12 documents were developed or renewed within the current year. Two were more than one and a half years old despite the fact that they were supposed to be renewed annually. Four documents were just over three years old, of these two had a planned renewal intervals of five years and the other two were supposed to be renewed annually but this was not done.

In summary the 19 key-characteristics of a high quality, interprofessional and evidence based CP, displayed in Table 1, were found in a range between seven and 14 fulfilled characteristics/ reviewed document (m 11.9, SD 2.8). When comparing the findings in the review with the same ICUs' self-reports (Table 5 and 4, respectively) some deviation was revealed, e.g. the reported use of systematic reviews and guidelines exceeded the actual use in the submitted examples.

## **DISCUSSION**

Our primary finding from this total national survey was that only a fifth of the Swedish ICUs were using CPs. There was a significant geographic variation but no relationships between the use of CPs and category of hospital, type of ICU, size of ICU or type of health record applied. Furthermore, the extension and content of the CPs in use as well as the degree to which they were interprofessional, evidence based and renewed varied.

In the southern region of Sweden almost one-half of the ICUs were using CPs versus only one ICU in some other regions. There is, to our knowledge, no publication specifying the use of CPs at ICUs in other countries. However, in the USA as many as 80% of hospitals have CPs (18) and also in Europe CPs are becoming more widely used even if the concept is relatively new in several countries (22). Consequently, from a global perspective, a minority of patients receives CP-based care (17). It is of international as well as national concern that the best evidence is not being applied in clinical practice and that patients are not given an equally high level of quality care (1, 3, 39). CPs can increase the quality of care, support evidence based practice and lead to more uniform care processes, thereby reduce the extent to which patients are left to individual health-care professionals' competence (10-14, 19, 26, 28, 40, 41). Thus it would benefit both patients and health care management if CPs were used more extensively. Invigorative, the proportion of Swedish ICUs using CPs has increased in recent years and several ICUs reported ongoing projects or plans for implementing CPs within a near future, indicating a progress within the field.

CPs should be used as a decision support tool for the entire interprofessional team (18, 20, 23, 26, 33), an approach fulfilled by the CPs at only some of the ICUs. Consistent with CPs in other European countries the CPs in the present study were mainly formed for, and developed by RNs (17, 22). The lack of involvement of physicians is one of the reasons cited for failure to implement CPs (42). Teamwork is crucial for optimal patient outcome given the

complexity of intensive care (9) and CPs can be an instrument for enhancing teamwork (28). Consequently a further interprofessional approach to CPs should be encouraged.

One major objective of CPs is to promote evidence based practice (17, 19, 22, 23, 26, 29) and CPs are to be decided from a systematically developed knowledgebase (5, 18, 23, 26, 30-32). In an international survey from 2006, half of the 23 participating countries stated that less than 40% of their CPs were evidence based (17). In the present study scientific knowledge was utilized to some extent by all ICUs. This implies a substantial improvement in comparison with a survey conducted in 2005 within Swedish in-hospital care, when only 32% of the documents referred to one or more peer-reviewed article, only one involved a systematic search and none had performed a quality assessment of the included literature (32, 33). However, not all the CPs in the present study were based on a systematic literature search and only a couple had assessed the quality of the included articles. Consequently, there is a need for further improvements. The most frequent literature utilized were original research articles, while the use of review articles and quality assured guidelines was less frequent. Since systematic reviews are less likely to misguide conclusions than original research might, they are to be preferred when health care professionals search for the best evidence for managing clinical problems (3, 4). If CPs are to be effective it is important that they have a proper scientific evidence base (41, 42). The local CP development team should include persons who are able to appraise scientific literature (3, 5, 23, 30-33) and they should be encouraged, when possible, to make use of review articles and quality assured guidelines instead of carrying out time consuming searches for and parlous interpretations of primary research (3). Evidence based practice can be understood as a process wherein clinical decisions about the individual patients care are based on knowledge that has been subject to critical scrutiny, generated from a range of sources (4, 5). In addition to scientific knowledge, clinical experience and contextual circumstances were reported to be evidence sources by about three-quarters of the ICUs and found in less than half of the reviewed documents. Clinical experience is embedded in practice and often tacit and intuitive. To disseminate this tacit knowledge to other practitioners and enable critical analysis, reflection and consensual validation it must be made explicit (5, 26). Since one objective of CPs is to summarize evidence and adapt it to the local structure (18), contextual circumstances are most likely embedded in the determination of recommendations in the CPs. Hence, it would be beneficial if the interprofessional reflections that take place in the CP-development process are expressed in the final documents more fully. Patients' preferences were the less utilized

evidence source, reported by only two ICUs and, as expressed by using local experiences from patients/ relatives, not found in any of the reviewed documents. However, in almost half of the reviewed CPs some of the references referred to research about ICU-patients' experiences, indicating that patients' experiences at a collective level were utilized to some degree (5). The involvement of patients and relatives when developing CPs is a prerequisite to creating high quality documents (30, 31) and should thus be extended. Since CPs are decided in advance, health care professionals must integrate the individual patient's preferences when applying the CP in the clinical situation (14, 43, 44). There is a need for further research about the developing and clinical application of CPs within the ICU context.

One cited weakness of CPs is the deficiency of integrating the latest evidence (20, 41, 42). As many as one-third of the reviewed documents were more than three years old. Since scientific knowledge and best practices are being developed rapidly, this seems to be too infrequent update, leading to a risk that patients are not being given the best available care. Keeping these documents updated is a time consuming task (29). The ICUs in Sweden, as well as in other countries, are struggling with economic constrains and staffing shortages (8, 35). Perhaps the deficiency in renewal is due to local management priorities. Keeping the CPs with their related knowledgebase updated is essential to enabling high quality care and evidence based practice (20, 30-32). Further national and international cooperation within the field is suggested to make the best use of the limited resources available.

A poor quality of CPs might have the clinical consequences of patients not receiving optimal care. Previously raised concerns about the quality of CPs (20, 32, 41, 42) are to some extent confirmed in the present study. To judge the quality of the CPs is a matter of interpretation but our results reveal that none of the Swedish ICUs have CPs that contain all key-characteristics of a high quality, interprofessional and evidence based CP as defined in the literature (5, 18, 20, 23, 26, 27, 29-33). However, when comparing with the Swedish survey from 2005 (32, 33) we see that the quality, degree of interprofessional approach and evidence base has increased. To develop, implement, evaluate and revise the CPs is a never-ending process and lessons are learned over time (26), emphasizing the need for further knowledge sharing and cooperation within the field.

## **Methodological considerations**

The present study describes a total survey of Swedish ICUs' use of CPs. Its strength is the 100% response rate. While useful as a basis for future projects, some methodological considerations should be noted. Firstly, the number of CPs available for the review was limited. We asked for only one example of CP/ICU and most probably the respondents chose to submit one of their best documents. Furthermore, five ICUs with self-reported use of CPs did not submit an example, despite being reminded. As always there is a risk that the non-response biases the results. However, examples were obtained from all categories of hospitals, general as well as specialized ICUs, ICUs of different sizes and with different types of health records. Secondly, incoherence between the self-report and the review revealed concerns in relation to the evidence base and renewal frequency. The reason for this could be that respondents had insufficient knowledge about the state of their unit's CPs or social desirability bias. Hence, the use of self-reports within research in this area should be questioned. Finally, the aim and questions were restricted to CPs. The ICUs might have other documents or decision support systems to promote high quality care that are not covered by this study.

### **Clinical implications and further research**

Progress has been made in the use of CPs within Swedish ICUs but we can conclude that there is potential for substantial improvements. Firstly, we suggest that it would be beneficial to both patient and health care managements if CPs were used more extensively. Secondly, a more interprofessional approach in the development and use of CPs should be encouraged to cover both medical and nursing areas in the care. Thirdly, the local CP-development team should include persons that have the knowledge to appraise literature and, when possible a further use of review articles and quality assured guidelines would be preferred. The method used in the development process should always be declared, an interprofessional reflection on clinical experience and contextual circumstances should be more fully expressed through the knowledgebase and the experiences of patients and relatives should be better utilized. Finally, more effort must be made to regularly renew the CPs. National and international cooperation within the field would be beneficial. Further research is needed to illuminate factors and conditions that are key to CP development, implementation and application in clinical practice, evaluation and impact on patient outcome.

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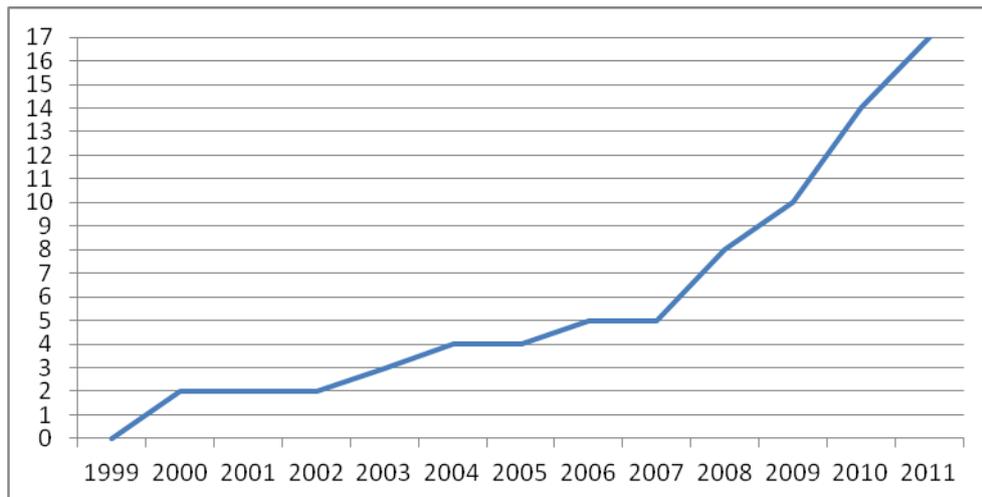
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**Figure 1** Swedish intensive care units (ICUs) using Clinical Pathways (CPs). Cumulative number based on the self-report regarding when the ICUs implemented their first CP.

**Table 1** Key-characteristics of a high quality, interprofessional and evidence based Clinical Pathway (CP) <sup>1</sup>

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**SCOPE**

Provides information about the condition/ clinical problem the CP is cover (which patients the CP is intended versus not intended for)

Interprofessional approach

Covering both medical and nursing areas

**DEVELOPMENT**

Development team including all relevant professional groups

Provides information about the development team/ authors (any conflicts of interest declared)

Provides information about methods used in the development-process, evidence search strategy, inclusion and exclusion criteria

Externally reviewed/ endorsed and piloted by the users

**CONTENT AND FORMAT**

Contains health problem/diagnosis, goal-setting and recommended interventions

Recommended interventions and outcome assessments are time-framed or criteria based

Provides information about what profession is responsible for the measures

Provides information about documentation (including variance management)

A structure making it possible to follow the process of care

Recommendations in the CP are explicitly linked to the supporting evidence in the related knowledgebase (references are declared through the knowledgebase)

**EVIDENCE BASE**

Scientific evidence systematically searched and quality assessed (review articles and quality assured guideline preferable)

Clinical experience are reflected upon and expressed

Contextual circumstances are reflected upon and expressed (review of health records preferable)

Patient' s preferences are included as evidence source (including patients in the development team preferable)

**RENEWAL**

The documents are up-to-date

Provides information about evaluation and renewal

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<sup>1)</sup> Summarized from literature (5, 18, 20, 23, 26, 27, 29-33).

**Table 2** Characteristics of participating Intensive Care Units (ICUs), specifying the ICUs that self-reported use of Clinical Pathways (CPs) and the ICUs that submitted a sample of CP.

	All ICUs N84		ICUs with CPs n17		ICUs submitted CP n12	
	n	%	n	%	n	%
<b>HEALTH CARE REGION <sup>1</sup></b>						
North	14	17	1	6	1	8
Uppsala-Örebro	19	23	3	17,5	3	25
Stockholm-Gotland	13	15	1	6	-	-
South-east	10	12	1	6	-	-
West	14	17	3	17,5	1	8
South	14	17	8	47	7	59
<b>CATEGORY OF HOSPITAL</b>						
University hospital	33	39	6	35	4	33
County hospital	20	24	7	41	6	50
Local hospital	31	37	4	24	2	17
<b>TYPE OF ICU</b>						
General <sup>2</sup>	65	77	14	82	9	75
Specialized	19	23	3	18	3	25
<i>Thorax</i>	8		2		2	
<i>Neuro</i>	6		-		-	
<i>Pediatric</i>	3		1		1	
<i>Burn</i>	2		-		--	
<b>SIZE OF ICU</b>						
1-5 beds	27	32	6	35	3	25
6-10 beds	47	56	9	53	7	58
≥ 11 beds	10	12	2	12	2	17
<b>TYPE OF HEALTH RECORDS</b>						
Electronic entirely	23	27	3	18	2	17
Combination of electronic and paper	61	73	14	82	10	83

<sup>1)</sup> In the statistical calculation the regions were collapsed into two categories; Northern regions (including Region North, Uppsala-Örebro, and Stockholm-Gotland ) and Southern regions (including Region South-east, West and South.

<sup>2)</sup> Includes ICUs limited to handling: Infection (n2), Gastro-enteral (n1), Medical-cardiology (n1)

**Table 3** Scope of the reported Clinical Pathways (n56)

<b>SCOPE</b>	<b>n</b>
<b>Care concerning specific nursing areas</b> e.g. prevention of fall/ pressure ulcer, managing central venous catheter/ tracheal tube/ tracheotomy, oral hygiene, nutrition, eye care, information of quality registration or mobile intensive care team	15
<b>Care of patients suffering of a diagnosis</b> e.g. cardiac-/ pulmonary disease, sepsis, trauma, head injury, aortic dissection, intoxication, hyperglycemic acidosis	14
<b>Care of patient with specified treatment</b> e.g. thrombolytic therapy, hypothermia after cardiac arrest, invasive-/ non invasive mechanical ventilation, intra-aortic balloon pumping, continuous renal replacement therapy	13
<b>Care of patients that have undergone surgical procedure</b> e.g. cardiac-/ aortic-/ thorax surgery, angiography or pacemaker installation	12
<b>Total care of an patient at the intensive care unit</b> extensive including multiple areas, e.g. ventilation, nutrition etc.	2

**Table 4** Self-reports of all Intensive Care Units (ICUs) using Clinical Pathways (CPs), the ICUs that submitted a sample specified. More than one option could be stated in each domain.

	All ICUs with CPs (n17)		ICUs submitted an CP (n12)	
<b>PROFESSIONS THE CPs ARE FORMED FOR</b>	<b>n=16</b>	<b>%</b>	<b>n=12</b>	<b>%</b>
Registered Nurses	16	100	12	100
Assistant Nurses	9	56	6	50
ICU-Physicians	6	38	5	42
Physiotherapists	2	12	1	8
Physicians from other units, e.g. surgeon	1	6	1	8
<b>APPROACH TO DEVELOPMENT OF CPs</b>	<b>n=17</b>	<b>%</b>	<b>n=12</b>	<b>%</b>
Team at the ICU	15	88	11	92
Team assembled from several units at the hospital	2	12	1	8
<b>PROFESSIONS PARTICIPATING IN DEVELOPMENT</b>	<b>n=17</b>	<b>%</b>	<b>n=12</b>	<b>%</b>
Registered Nurses	17	100	12	100
ICU-Physicians	11	65	8	67
Assistant Nurses	10	59	7	58
Physician other unit, e.g. surgeon	7	41	6	50
Physiotherapist	5	29	5	42
Occupational-/speech therapist, dietician, counselor	4	24	4	
<b>CONTENT OF THE CPs</b>	<b>n=16</b>	<b>%</b>	<b>n=12</b>	<b>%</b>
Health problems/ risk or resource diagnosis	13	81	10	83
Goal-setting	15	94	12	100
Planned interventions	16	100	12	100
Performed interventions	14	88	10	83
Space for outcome documentation	13	81	10	83
<b>STRUCTURE OF THE CPs</b>	<b>n=16</b>	<b>%</b>	<b>n=12</b>	<b>%</b>
VIPS-model <sup>1</sup>	11	69	8	67
No specified structure	5	31	4	33
<b>DOCUMENTATION OF THE CPs</b>	<b>n=16</b>	<b>%</b>	<b>n=12</b>	<b>%</b>
Electronic health record	8	50	6	50
Paper based health record	8	50	6	50
<b>EVIDENCE BASE OF THE CPs</b>	<b>n=16</b>	<b>%</b>	<b>n=12</b>	<b>%</b>
<b>Scientific knowledge</b>				
Systematic review of literature	13	81	10	83
Journal articles/ textbooks	16	100	12	100
National guidelines/ public reports	14	88	10	83
<b>Clinical experience</b>				
Current practice	11	69	7	58
External expertise	8	50	6	50
<b>Contextual circumstances</b>				
Regional/ local guidelines	12	75	8	67
<b>Patient preferences</b>				
Experience from patients/ relatives	2	12	1	8
<b>ROUTINE FOR RENEWAL OF THE CPs</b>	<b>n=16</b>	<b>%</b>	<b>n=12</b>	<b>%</b>
Once/ year	8	50	7	58
Every second year	7	44	4	33
No routine	1	6	1	8

<sup>1</sup>) VIPS-model: a model for nursing documentation, Swedish acronym from; well-being, integrity, prevention and security (38).

**Table 5** Findings from the review of submitted Clinical Pathways (CPs) with related knowledgebase (n12).

<b>SCOPE</b>	<b>n=12</b>	<b>%</b>	
Condition/clinical problem clearly declared	11	92	
Covering both medical and nursing areas	10	83	
<b>PROFESSIONS THE CP WERE FORMED FOR</b>	<b>n=12</b>	<b>%</b>	
Registered Nurses	12	100	
Assistant Nurses	6	50	
ICU-Physicians	7	58	
Physiotherapists	1	8	
<b>PROFESSIONS PARTICIPATING IN THE DEVELOPMENT</b> <sup>1</sup>	<b>n=9</b>	<b>%</b>	
Registered Nurses	9	100	
ICU-Physicians	4	44	
Assistant Nurses	4	44	
Physician other unit, e.g. surgeon	1	11	
<b>CONTENT OF THE DOCUMENTS</b>	<b>n=12</b>	<b>%</b>	
Name of author and date of development and renewal	12	100	
Developing methods declared	7	58	
Documentation routine and variance management declared	11	92	
Health problems/ risk or resource diagnosis	8	67	
Goal-setting	9	75	
Planned interventions	12	100	
Profession that should do interventions	8	67	
When interventions should be done	4	33	
Profession that should assess outcome	6	50	
When outcome should be assessed	4	33	
<b>STRUCTURE OF THE DOCUMENTS</b>	<b>n=12</b>	<b>%</b>	
VIPS-model <sup>2</sup>	9	75	
No specified structure	3	25	
<b>EVIDENCE BASE</b>	<b>n=12</b>	<b>%</b>	<b>No/doc</b>
References thru-out the knowledgebase	10	83	
<b>Scientific knowledge</b>			
Systematic review of literature conducted	7	58	
Included literature quality audited	2	16	
Journal articles/ textbooks	12	100	3-163
<i>Research articles</i>	12	100	2-115
<i>Review articles</i>	8	67	1-24
<i>Other journal articles</i>	10	83	1-6
<i>Textbooks</i>	9	75	4-32
<i>The handbook for Healthcare</i> <sup>3</sup>	5	42	
National guidelines/ public reports	6	50	1-8
Other	8	97	2-17
<i>Guidelines from specialist associations</i>	7	58	1-13
<i>Doctoral thesis</i>	2	16	1-2
<i>Unpublished work e.g. master diss. or information brochures</i>	5	42	1-2
<b>Clinical experience</b>			
Current practice, professional experience utilized	5	42	
External expertise	5	42	
<b>Contextual circumstances</b>			
Regional/ local guidelines	4	33	2-5
Review of health record were conducted	4	33	
<b>Patients' preferences</b>			
Published experiences from patients/ relatives	5	42	1-8
Local experiences from patients/ relatives	0	-	
<b>YEAR OF DEVELOPMENT/ LAST RENEWAL</b>	<b>n=12</b>	<b>%</b>	
2011	6	50	
2010	2	16	
2008	4	33	
<b>ROUTINE FREQUENCY FOR RENEWAL</b>	<b>n=12</b>	<b>%</b>	

Once/ year	9	75
Every fifths year	2	17
No declared plans	1	8

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<sup>1)</sup> Not possible to asses in 3 documents since the profession of the authors not was declared.

<sup>2)</sup> VIPS-model: a model for nursing documentation, Swedish acronym from; well-being, integrity, prevention and security (38).

<sup>3)</sup> A quality assured Swedish national website that offer comprehensive guidelines ([www.vardhandboken.se](http://www.vardhandboken.se)).