

PRIORITY BRIEFING

The purpose of this briefing paper is to aid Stakeholders in prioritising topics to be taken further by PenCLAHRC as the basis for a specific evaluation or implementation research project. They were compiled in 2-3 days.

Would a systematic specialist review of all diabetes patients admitted to hospital improve their care and safety?

Question ID: 7

Question type: Implementation

Question: Would a systematic specialist review of all diabetes patients admitted to hospital improve their care and safety?

Population: All diabetes patients diagnosed prior to admission or during admission.

Problem: Insulin generates one of the largest numbers of prescribing related incidents. Given that many more problems are picked up outside of the incident reporting systems it is likely that it is an even bigger problem than currently recognised. The National Patient Safety Agency is expected to highlight this problem in the future. In addition to the safety/medical perspective, patient surveys frequently highlight the poor experience that many diabetes patients have and in one hospital there were 3 related deaths from untreated diabetic keto-acidosis or hypoglycaemia in a 2 year period in established inpatients.

Service and setting: All wards in a teaching hospital but applicable to any hospital.

Solution: An IT solution would automatically cross-reference all patients admitted (onto a standard PAS system) against the biochemistry database for recent measurement of HbA1c >6.5% and/or random glucose >=11.1 or fasting glucose >= to 7.0 including admission blood tests to pick up new diagnoses. The diabetes specialist team would review all such patients once and give guidance as to the direction of their care; sometimes leaving standardised diabetes care plans, at other times individualised.

Outcome: Improve inpatient diabetes control, shorten length of stay, improve HCPs (Health Care Professional) knowledge of diabetes, improve patient satisfaction, and most importantly patient health and safety. If successful it would give a model for diabetes care nationally and internationally

Diabetes: Diabetes is a common life-long condition where the amount of glucose in the blood is too high as the body cannot use it properly. There are two types of diabetes: Type 1 diabetes which develops when the insulin-producing cells have been destroyed and the body is unable to produce any insulin. Usually it appears before the age of 40, and especially in childhood. It is treated with

insulin either by injection or pump, a healthy diet and regular physical activity; Type 2 diabetes which develops when the body doesn't produce enough insulin or the insulin that is produced doesn't work properly. Usually it appears in people aged over 40, though in South Asian and Black people it can appear from the age of 25. It is becoming more common in children and young people of all ethnicities. It is treated with a healthy diet and regular physical activity, but medication and/or insulin is often required. As our understanding of the genetic basis for diabetes improves a range of more subtle, but important, variants are being recognised.

The Health Problem

Diabetes UK report that around 10 per cent of all hospital beds in the UK are occupied by people with diabetes and that people with diabetes tend to have a longer length of stay and are admitted more often than the general population. Patients often experience a deterioration of their diabetes control and report feelings of fear and worry as a result of their inpatient care. Patients with diabetes also report feeling that non diabetes specialist staff lack basic knowledge about diabetes, leading to problems concerning:

- Co-ordination and timeliness of meals and treatment,
- incidences of hypo and hyperglycaemia including those where staff did not know how to manage these acute complications and /or they were not handled in a timely manner,
- medicines mismanagement,
- inappropriate food related myths,
- lack of communication between the professionals involved in a person's care
- lack of information provision during the inpatient stay and at discharge.

In a recent Healthcare Commission survey (2004) it was reported that 76 per cent of respondents were not visited by a diabetes specialist team member. The National Service Framework (NSF) for diabetes (2007) also supports these findings stating that people with diabetes are admitted to hospital twice as often and stay twice as long than those without diabetes, and also frequently describe poor experiences of inpatient care. The NSF recommends that timely liaison with a diabetes team can both prevent the need for diabetes-related admissions and, where hospital admission is unavoidable, prevent complications during admission and delayed discharge.

Guidelines:

The NICE report on *Technical patient safety solutions for medicines reconciliation on admission of adults to hospital* (2007) reported that data on the effectiveness of IT solutions were sparse and highlighted a lack of equipment and lack of training as barriers to the introduction of IT solutions. They also commented that IT interventions may be difficult to distinguish from pharmacist-led programmes that include an IT element. They also noted that potential problems relating to unfamiliarity with new IT systems may result in the transmission of incorrect information and will not reduce the need to involve trained experts to check patient medication. The report suggests there is insufficient evidence to recommend any particular method. The report also suggests that pharmacist-led interventions are likely to be the most successful

way of preventing medication errors. However, it recommends the development and evaluation of IT-based solutions for medicines reconciliation and that this research should evaluate the practicalities of implementing IT solutions and identify any problems that may need to be addressed.

The Diabetes UK position statement '*Improving Inpatient Diabetes Care – what care adults with diabetes should expect when in hospital*' (2009) recommends the development and implementation of protocols and /or systems to cover; communication, ongoing referral, surgery, prevention and the timely and effective management of acute complications.

The National Service Framework for Diabetes (DoH, 2007) states that all children, young people and adults with diabetes admitted to hospital, for whatever reason, will receive effective care of their diabetes and wherever possible, they will continue to be involved in decisions concerning the management of their diabetes. However, they do not state what such a service might look like.

NHS Priority

Regional

SW SHA Priorities framework 2008-11

- reduce emergency bed days for patients with long term conditions
- implement hospital systems that support clinical activity (electronic clinical orders, prescribing and care pathways) in all acute NHS trusts in the south west by March 2011

Local

Local perspective

- Plymouth Hospital framework aims to provide good symptom control for patients with long term conditions and to provide networked services with good communications.

Existing Research

Published research

No systematic reviews were identified in this area of research. There were a limited number of research studies that have investigated the use of an IT solution in identifying inpatients with diabetes and consequently improving their care. No studies identified by the searches conducted for this briefing detailed the type of IT solution proposed in this submission. However, there is evidence that IT solutions can be used to identify inpatients with diabetes and help to more appropriately direct diabetes specific skills and knowledge base to areas in the hospital with a higher frequency of diabetic patients.^{1,4} Some IT solutions already

exist (POCT – point of care testing) but further research and evaluation needs to be conducted to improve care and outcomes for patients⁴. One study that reports on diabetes care in hospital found that although practitioners were aware of patients with diabetes at admission it tended to be overlooked during hospitalization.² Very little information was recorded and often no plans were made for a diabetes follow-up or discharge care plan. Other studies looking at the management of inpatient diabetes care fail to mention IT as part of the solution package.^{2,3}

Ongoing Research:

No ongoing research was identified in this research area.

Feasibility:

Uncertain as likely to relate to specific systems in hospitals and feasibility of record linkage.

References

1) Bozzo, J., B. Carlson, et al. (1998). "Using hospital data systems to find target populations: new tools for clinical nurse specialists." Clin Nurse Spec **12**(2): 86-91.

A newly appointed diabetes clinical nurse specialist/nurse practitioner at Yale-New Haven Hospital was charged with redesigning the diabetes nursing role. For help, she turned to a special information management service within the Nursing and Operational Finance departments. This article describes the project that used an integrated financial and clinical information system to locate and characterize adult patients with diabetes mellitus. Patients with principal and secondary diagnoses of diabetes were identified by ICD-9-CM codes and tracked across inpatient and outpatient services. These data were used to identify opportunities for case management and for managing the costs related to diabetes care. The data also supported proposals made by the clinical nurse specialist/nurse practitioner to management to allocate clinical resources for the care of patients with diabetes. When the clinical wisdom of advanced practice nurses is joined with nursing information management expertise and technology, opportunities for understanding and advancing nursing's work are revealed.

2) Knecht, L. A., S. M. Gauthier, et al. (2006). "Diabetes care in the hospital: is there clinical inertia?" J Hosp Med **1**(3): 151-60.

BACKGROUND: Effective control of hospital glucose improves outcomes, but little is known about hospital management of diabetes. **OBJECTIVE:** Assess hospital-based diabetes care delivery. **DESIGN:** Retrospective chart review. **SETTING:** Academic teaching hospital. **PATIENTS:** Inpatients with a discharge diagnosis of diabetes or hyperglycemia were selected from electronic records. A random sample (5%, n = 90) was selected for chart review. **MEASUREMENTS:** We determined the percentage of patients with diabetes or hyperglycemia documented in admission, daily progress, and discharge notes. We determined the proportion of cases with glucose levels documented in daily progress notes and with changes in hyperglycemia therapy recorded. The frequency of hypoglycemic and hyperglycemic events was also determined. **RESULTS:** A diabetes diagnosis was recorded at admission in 96% of patients with preexisting disease, but daily progress notes mentioned diabetes in only 62% of cases and 60% of discharge notes; just 20% of discharges indicated a plan for diabetes follow-up. Most patients (86%) had bedside glucose measurements ordered, but progress notes tracked values for only 53%, and only 52% had a documented assessment of glucose severity. Hypoglycemic events were rare (11% of patients had at least one bedside glucose < 70 mg/dL), but hyperglycemia was common (71% of cases had at least one bedside glucose > 200 mg/dL). Despite the frequency of hyperglycemia, only 34% of patients had their therapy changed. **CONCLUSIONS:** Practitioners were often aware of diabetes at admission, but the problem was often overlooked during hospitalization. The low rate of documentation and therapeutic change suggests the need for interventions to improve provider awareness and enhance inpatient diabetes care.

INTERESTING INFO ON ADMISSION INFO

3) Moghissi, E. S. "Addressing hyperglycemia from hospital admission to discharge." Curr Med Res Opin **26**(3): 589-98.

BACKGROUND: This review examines glycemia management practices in hospitalized patients. Optimal glyceemic control remains a challenge among hospitalized patients. Recent studies have questioned the benefit of tight glyceemic control and have raised concerns regarding the safety of this approach. As a result, medical societies have updated glyceemic targets and have published new consensus guidelines for management of glycemia in hospitalized patients. This review highlights recent inpatient glyceemic trials, the new glyceemic targets and recommended strategies for management of glycemia in hospitalized patients. **METHODS:** Medline and PubMed searches (diabetes, hyperglycemia, hypoglycemia, intensive therapy insulin, tight glyceemic control, and hospital patients) were performed for English-language articles on treatment of diabetes, insulin therapy, hyperglycemia or hypoglycemia in hospitalized patients published from 2004 to present. Earlier works cited in these papers were surveyed. Clinical studies, reviews, consensus/guidelines statements, and meta-analyses relevant to the identification and management of diabetes and hyperglycemia in hospitalized patients were included and selected. This is not an exhaustive review of the published literature. **RESULTS:** Insulin remains the most appropriate agent for a majority of hospitalized patients. In critically ill patients insulin is given as a continuous intravenous (IV) infusion and in non-critically ill inpatients hyperglycemia is best managed using scheduled subcutaneous (SC) basal-bolus insulin regimens supplemented with correction doses as needed and adjusted daily with the guidance of frequent blood glucose monitoring. Prevention of hypoglycemia is equally as important to patient outcomes and is an equally necessary part of any effective glucose control program. Modern insulin analogs offer advantages over the older human insulins (e.g., regular and neutral protamine Hagedorn [NPH] insulin) because their time-action profiles more closely correspond to physiological basal and prandial insulin requirements, and have a lower propensity for inducing hypoglycemia than human insulin formulations. Long-acting basal insulin analogs (glargine, detemir) are suitable and preferred for the basal component of therapy; rapid-acting insulin analogs (aspart, lispro, glulisine) are recommended for bolus and correction doses. Sliding-scale insulin (SSI) regimens are not effective and should not be used, especially as this excludes a basal insulin component from the therapy. **CONCLUSIONS:** Optimal glyceemic management in the hospital setting requires judicious treatment of hyperglycemia while avoiding hypoglycemia. Insulin is the most appropriate agent for management of hyperglycemia for the majority of hospitalized patients. Intravenous insulin infusion is still preferred during and immediately after surgery, but s.c. basal insulin analogs with prandial or correction doses should be used after the immediate post-operative period, and also should be used in non-critically ill patients. Frequent and effective glucose monitoring is critical for avoiding wide deviations from acceptable glucose levels, which under a recently promulgated consensus guideline currently range

between 140 mg/dL and 180 mg/dL. Glucose targets near 140 mg/dL are recommended as being the most appropriate for all hospitalized patients.

4) Peeples, M. and D. Rice (2006). "Tools, technologies, and informatics: supporting glycemic control." Endocr Pract **12 Suppl 3**: 100-7.

OBJECTIVE: To overcome the challenges involved in the adoption and implementation of standards of glycemic control in the inpatient setting.

METHODS: Three major barriers to effective glycemic control are examined, and solutions are discussed. **RESULTS:** The diabetes care process occurs at several levels of the hospital system, including the community level. Each level must be considered when solutions for glycemic control are determined and implementation planned. Workflow coordination is another challenge; it addresses the end users who provide patient care and use information support. Informatics, or the application of information technology to healthcare, can facilitate system-level and workflow integration efforts to improve glycemic control. **CONCLUSION:** Glycemic control can be achieved through coordinated and facilitated efforts at each level of the hospital system--individual, unit, and hospital-wide. Multidisciplinary team coordination, workflow integration, effective information sharing, and communication are required.