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Development of Assessment Package for Dental Schools Integrated into Electronic Health Record

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Abstract

Purpose: An assessment application compatible with the electronic health record was created as a means of student evaluation. A look at one full of year of use indicates challenges ahead.

Method: This study was determined to not requireIRB review by a committee formed through the School of Dentistry's Associate Dean of Research office. The form is fromthe institution's IRB to determine whether projects are human subjects' research and our exemption is due to the intention of this project being to enhance and improve the current assessment package. Students at the University Of Mississippi School Of Dentistry began using EPIC wisdom and a corresponding assessment application. The assessment application includes all third and fourth year dental students, clinical courses with assessments and corresponding rubrics. Student provider progress reporting application was used to determine quantity of procedures completed.Direct restorations procedures completed requiring assessment from student progress reporting were compared to corresponding grading rubrics. These were counted during a 12 month time period foreach student to look for any discrepancies.

Results: Between August of 2018 and August of 2019, 695 procedures were completed for thirteen different direct restoration CDT codes. Those same CDT codes correlated to 647 grade sheets in our assessment application.

Conclusions: It is determined that not all procedures are graded as designed. This may be omitted for various reasons, forgetfulness, omission due to poor performance, or student has met the recommendations or criteria in that division and will not see any grade improvement from additional procedures or grade sheets.

Keywords: Electronic health records; Technology; School dentistry; Dental school assessment

Introduction

After adopting an electronic dental module within an existing electronic health record in a health science center, the dental school was left without an electronic means of student evaluation. Epic Systems Corporation, or Epic is a healthcare software system used worldwide in a variety of healthcare setting including academic medical centers. More than 250 million patients have electronic health records in Epic. Epic has over 20 clinical, specialty and ancillary modules available to be tailored for an institution's needs. The University of Mississippi Medical Center adopted Epic as its electronic health record (EHR) in 2012. In 2017, the university began planning the addition of Epic's dental module, Wisdom. The process involved the Epic development team, university information technology team and dental school stakeholders with planning and development for the implementation of Wisdom Differences identified for dental users compared to medicine were the tools for tooth and periodontal charting and the coding and template development needed to develop treatment planning in a dental school setting. Epic's Wisdom module had previously been used in hospital only and corporate settings as part of an integrated electronic health record.

For the dental school setting, the addition of Epic Wisdom would also allow integration with the academic medical center's ambulatory and hospital clinics. Wisdom allowed the dental school access to a patient's complete health care record and increased collaboration with the medical providers for all aspects of the patient's care. Dental providers in Wisdom have the ability to view and update health history, allergies, medications and demographics. The complete health history, dental charting, dental treatment planning, scheduling and billing are integrated into Epic through Wisdom. In order to facilitate an integrated approach to meet a patient's needs, it was imperative to achieve an electronic system that can house all medical, dental, radiologic records and be accessible by all parties. 1 In an educational institution the integrated electronic health record helps to close the gap of knowledge between medicine, new awareness of the importance of oral

health on a patient's systemic health and dentistry's limited application of overall health in its curriculum. 2

One challenge identified early by dental school stakeholders was the inability of Epic to provide for the clinical assessment of the dental student providers. The medical school did not have any type of assessment, or grading package, for medical students. UMMC School of Dentistry legacy software system allowed the coding, billing, documentation, and assessment or grading of students. Wisdom allowed all of these with the added integration of the medical record except the ability for assessment and grading.

In order to engage the students of today and to continue on the path of utilizing technology, it was important to develop a grading system that could be integrated into the electronic health record as well as be modified for a school to suit their needs. In addition, each department within a school had specific requests to employ such a grading tool. 3 Throughout North American dental schools, it is recommended that dental schools will use objective assessment tools, such as rubrics, and include a student self-assessment component. Student self-assessment allows the student to develop decision making and critical thinking skills. It also teaches individuals to self-critique their work and prepares them to become lifelong learners. 4

The assessment package had to be developed by current faculty and by local information technology staff. All faculty in the School of Dentistry were asked to develop grade sheets that could be entered into the grading package. This required each department in the dental school to develop scoring guides for clinical procedures to be assessed for student performance in departmental clinics. These grading rubrics were then manually entered for each code, or type of procedure. Faculty that are permitted to grade each procedure were linked to the grade sheets. Students were linked to each class and then put in a format where all the grade sheets per student culminated under each of their names. Faculty were able to weight grade sheets of each type and come out the correct weighted grade calculation. If there appeared to be a different way to do an average or a formula, the programmers met with faculty regularly and would code the needed result.

When students complete a procedure in the dental school in Epic Wisdom, it gives them an option to initiate a grade sheet. They select the correct clinic, and grade sheet they need. Because they enter this information while in the visit encounter, the patient name, tooth, surface all populate the grade sheet page. It also gives faculty an option to grade the sheet chairside before the encounter is closed. If the faculty are tied up, the grade sheet can be self-assessed by the student first and they can inbox this to the correct covering faculty. Faculty are able to complete their assessments chairside during clinic times, or in office using the app. The app gives the provider the link to the sheets that need to be completed, as well as each clinic with each student's progress, and different reports to map general progress of the class.

It continues to be a work in progress. Faculty during busy clinic times end up doing all grade sheets at the end of the week or later which allows for inaccuracies and embellished grades if the faculty doesn't recall the procedure in detail anymore. If the student forgets their grade sheets, they do not receive credit for the procedure. In particular the grading application is best used when the student is in the encounter and initiates the grade sheet. When and if students are permitted to using the application outside the patient encounter, it will not self-populate the tooth, and surface omitting critical information the faculty need to provide an assessment. A comment box can be used as a communication tool between faculty and student to request this or any other information that may be needed.

Several benefits emerged from this method of grading. It allows covering faculty to not have to go into patient charts to find information to put on the grade sheet. It is utilizing technology to the fullest and eliminating any paper grading. Some departments keep a backup or a check list file on one sheet for students that is still on paper. The school plans to utilize the grading records for accreditation work as assigned in the future.

One flaw in the system is that faculty cannot track whether each procedure completed in the clinic has a corresponding grade sheet generated. Because the grade sheets are generated on the student side, the student can decide whether to request credit for the procedure. In the instance that the student feels they did not do a good job on the procedure or that they are ahead in their requirements for that section, they can choose not to request a grade sheet.

Method

A self-assessment tool from the institution'sIRB determined that this study did not require IRB review. This tool is a form filed with the School of Dentistry's Associate Dean of Research office that distinguishes whether projects are human subjects' research, and it was determined that IRB review was not required due to the intention of this project being to enhance and improve the current assessment package. To find the correlation between the number of procedures being completed and whether each procedure had a corresponding grade sheet, we extrapolated the number of amalgam and composite restorations completed in a one year span, August 2018-August 2019 by the senior class. Although they graduated in May, we have several that were continuing to complete requirements into the summer. We then identified the number of grade sheets that had been submitted during that same time span.

We used the operative division of the restorative department because the procedures are typically charged out in the same visit day as the procedure correlating to one grade sheet on the same day. In order to not have procedures that carry from visit to visit, we limited the search to thirteen CDT codes that are for direct restorations of amalgam or composite.

Results

We used a search criteria for thirteen codes into EPIC wisdom that indicated 695 procedures total. This included our regular clinic and mission week procedures where students were asked to submit corresponding grade sheets. These are found on two different reports due to differences in billing. Figure 1 shows operative procedures from regular clinic days, while Figure 2 shows procedures conducted during mission week that were not billed to the patient. We found that during the same time period in the EPIC grading package, the class of 2019 had 647 grade sheets for those procedures that covered the thirteen codes. There is a difference of approximately 48 grade sheets.

Discussion

The results indicate that the number of grade sheets submitted for evaluation is far less than actually produced in the same time period. This can be for a variety of reasons. There currently does not exist a method to auto generate a grade sheet that would not allow the patient encounter to close electronically until the sheet is completed. Students are not generating the sheets for several reasons: mainly after their requirements for the specific division are met, they do not gain a benefit to incorporate extra grades unless they are trying to bring up their average in that section. They also can choose not to submit a sheet if they feel the evaluation will be poor and hurt their average. Many student forget to generate these and once the encounter is closed, they will have to recall all the information to go through the app. To rectify this issue, programming can be built in to prompt a grade sheet for every charged procedure; if the student wishes to bypass the prompt, it would require a faculty to sign off to omit a grade sheet. This will hold the student accountable for each procedure, but it an added step if there is a true omission needed. There also needs to be report generated that indicates each procedure that doesn't have a correlated grade sheet. That could identify students who are habitual at skipping the step, or have this incorporated into their overall average grade.

Conclusion

Epic Wisdom as a part of Epic has allowed for integrated healthcare. Physicians and dentists are able to see one another's recommendations for patient care and work congruently to provide better overall care for patients. For a dental school to function in an electronic setting, it was imperative to be able to assess students in a clinical setting. This will aid our students and dentists in Inter Professional Education (IPE). One of the main barriers to IPE is dentists unable to have access to a patient's medical records. When it is not integrated, this culminates into multiple phone messages, emails, to request the records. This can be time consuming and delay providing much needed treatment for a patient. 5 Kaiser Permanente is one of the first companies to provide this integrated system which is EPIC.

To improve the assessment package, it must be linked or mandatory to initiate a grade sheet prior to the student closing the encounter. If this is not rectified in the near future, there could be an even larger gap between the procedures completed and grade sheets submitted. This would give us inaccurate overall assessments of student abilities.

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