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**The Social Construction of Accountability: Radiologists and Their Recordkeeping
Practices¹**

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Abstract

Recordkeeping practices are a central means by which organizations demonstrate accountability. These practices, though, are socially constructed and owe as much to organizational or professional cultural and ethical norms as laws or procedural manuals. This paper discusses of accountability as a social construction situated in a specific spatial, temporal, and social setting, specifically it details a qualitative study of radiological reading rooms. This research focuses on the preparation of one form of documentary evidence, the radiological report. Major findings include the need to think about accountability in the plural. Multiple accountabilities exist in both recordkeeping processes and in the records themselves. Sustaining and balancing these accountabilities can be difficult and lead to compromises. Furthermore, accountabilities are the result of an iterative process between the individual and organizational levels that is required to make accountability robust and work.

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Introduction

Recordkeeping practices are part of larger organizational communication patterns that influence what information is recorded, when and where that information is stored and made available, and how that information is recorded. Therefore, understanding of the formal and informal communication and information flow patterns as well as the internal and external constraints and their influence on organizational recordkeeping practices is required to understand the creation and identify the loci of accountability in organizations. This paper explores the complex connections between both formal and informal organizational processes and recordkeeping practices and how accountability and warrant are constructed and deconstructed through these organizational interactions.

Warrant is defined as statements in the “law, customs, standards, and professional best practices accepted by society and codified in the literature of different professions concerned with records and recordkeeping (Duff 1998, 91).” The underlying assumption here is that warrants bolster one another and form a coherent whole. This paper extends the concept of warrant to include uncoded practices and tacit knowledge in communities of practice.

Discursive practices are used by members of a profession to shape events in the domains subject to their professional scrutiny. The shaping process creates the objects of knowledge that become the insignia of a profession’s craft: the theories, artifacts and bodies of expertise that distinguish it from other professions.

Analysis of the methods used by members of a community to build and contest the events that structure their lifeworld contributes to the development of a practice-based theory of knowledge and action (Goodwin 1994, 606).

These uncodified statements may conflict, compete, or be molded into localized practice far removed from related written warrants. Although thinking about warrant in terms of practice complicates an understanding of records creation and recordkeeping systems, it does provide an insight into the social construction of accountability and how multiple accountabilities exist simultaneously, if uneasily, within one social system.

The paper is divided into two parts. The first part is a discussion on accountability. The latter section examines the construction of accountability in radiological reading rooms, specifically in the preparation of one form of documentary evidence, the radiological report. The radiological research is based on a larger study encompassing 150 hours of observations over a five-month period in two radiological modalities: ultrasound imaging and chest radiography, interviews with clinicians, and archival research (Yakel 1997). The research site was a large tertiary care medical center comprised of six teaching hospitals and over 150 affiliated clinics serving over 800,000 in and out patients per year. Teaching, specifically the training of radiological residents, provided an ideal opportunity to observe how practices and guidelines were articulated and often demonstrated by the supervising or attending radiologists to the residents.

1. The Construction of Accountability

The term accountability has been bandied about more frequently in recent years. The root of accountability is account, according to the *Oxford English Dictionary* (OED), the term itself has a dual origin from the Latin *accomputare*, meaning to compute and from the French *a conter*, to tell a story. English usage of the former sense of the term, to compute, has been documented since the fourteenth century. The latter sense of account, a narration or relation, though, was a seventeenth century evolution. When the term

accountability arose in the eighteenth century, accountability was imbued with all of these meanings of accounts. As we move from thinking about accounts and accountability in terms of finances or renderings to more of a narration, accountability should be viewed more as a practice than as an outcome. So, if we are concerned about accountability, this is another reason archivists should be concerned with the recordkeeping practices and not just the record as output.

In his introductory chapter to *Accountability: Power, Ethos and the Technologies of Managing*, Rolland Munro describes accountability as an informal giving that is part of every day conversation as well as more formal transactions generally involving some sort of documentary artifact (what we archivists refer to as a “record.”). He notes that the authors move “between accounts as stories, explanations and reasons for conduct on the one hand and accounts as coded representations, records, often in the form of numbers, on the other hand” (Munro 1996, 2). Each of these modes mediates the other in what he refers to as “accountability relationships.” “Distributions of materials and devices are as much an *effect* [italics original] of the giving and calling for accounts, as they are integral to the business of producing and consuming accounts” (Munro 1996, 3). Records are both intermediaries in the accountability process as well as evidence of it.

In our daily language we often refer to accountability as something that must be achieved, rather than as something that is done informally yet continuously. The difference here is between viewing accountability as a thing represented by an artifact, such as a record, and thinking about accountability as a process in which people and records must interact to achieve accountability. In this latter view, the focus on

accountability becomes an analysis of the methods people use to engage in accountability relations (Munro 1996, 4).

Kevin Kearns proposes that people should think about creating an "*accountability environment*" [italics original]. He defines accountability in three senses.

We will see that managing the accountability environment in these turbulent times involves much more than merely complying with legal and regulatory mandates, which itself is no small task. Rather, being accountable sometimes involves negotiating with and appropriately responding to the demands of clients, special interest groups, and other powerful stakeholders. Other times, accountability is defined in terms of discretionary judgments, calculated risks, and entrepreneurial ventures. Finally, accountability is sometimes defined in terms of administrative advocacy, when government and nonprofit professionals must interpret and communicate the needs of citizens to higher authorities who have the power and resources to meet those needs (Kearns 1996, xv-xvi).

For Kearns, accountability is more than formal reporting to a higher authority. The concept of accountability includes public expectations of performance, responsiveness, and morality to a broad range of people and institutions. Furthermore, these expectations related to obligations and responsibilities are subjectively interpreted and can be contradictory (Kearns 1996, 8).

Accountability is made up of both alignment (narrative) and identity work (the self portrait that is painted when people give and ask for accounts). Harold Garfinkel states that every "setting organizes its activities to make its properties as an organized environment of practical activities detectable, countable, recordable, reportable, tell-a-

story-about-able, analyzable - in short *accountable* [italics original].” (Garfinkel 1967, 33). Accountability makes the invisible visible. But, it does more than make actions visible; it gives them a potentially long-term visibility. Accountability does not just serve as evidence of present actions, but also becomes part of the conditions for future actions. “The processes of accountability, properly understood, provide a clear explanation of how ethos comes to be produced and reproduced” (Munro 1996, 13).

Seen in this manner, accountability forms a key element in organizational stability. According to Karl Weick, accountability is enacted and reenacted in organizations forming interlocking routines, mutually reinforcing interpretations, and continuous patterns of communication (Weick 1995, 170). These routines, interpretations, and communication patterns provide organizations with encoded means for sensemaking and the ability to sustain themselves over time.

The discussion of accountability raises key questions. Who is accountable to whom? Why are certain forms of accountability established and who makes this selection? Eisenberg, for example, discusses the earnings predictions in the United States. For U.S. businesses, predicting earnings can open companies up to litigation if earnings fail to meet projections. As a result, and stock prices fall. Once a forecast is made, the corporation is accountable for disclosing any adverse information that might undermine the prediction. In turn, one disclosure may lead to others as it creates a precedent and further accountability pressures (Eisenberg 1993).

Moving from a definition of accountability to a discussion of how accountability is constructed, Carl Friedrich and Herman Finer debate whether accountability should be established through systems of external (e.g., regulations and oversight) or internal

(professionalism and self-policing) controls or warrants. In actuality, accountability processes combine both of these elements. The question becomes in what types of organizations is one of these methods stronger and what difference does this make in recordkeeping practices? Willmott notes that accountability is framed in cultural and historical ways, rather than as a natural, authoritative, or universal set of precepts. "Frameworks of accountability are not restricted to formal accountability systems, such as annual statements of accounts to shareholders...or procedures. Formal accounting systems are always embedded in already established frameworks of accountability that make such systems relevant and meaningful (Willmott 1996, 23)." These frameworks provide a context for understanding the selection and meaning of particular accounts.

J.D. Stewart also distinguishes between "bonds of accountability" and "links of account." Bonds of accountability are contractually defined accountability relationships. Links of account imply an informal 'recognition of responsiveness' (Stewart, 1984, 25). Stewart's points echo those of Munro and Weick. First, the importance of accountability as a process is highlighted in recognition of responsiveness. Second, recognition of responsiveness implies a continuous pattern of communication necessary to carry out the bond or contract.

Stewart also raises the issue of interconnected levels of accountability. He cites five levels of accountability in organizational processes: accounting for legality, process accountability, performance accountability, program accountability, and policy accountability. These all imply different objects of accountability and different artifacts of accountability. Accounting for legality examines patterns, such as expenditures, leaving considerable freedom of action. Process accountability focuses on making the process or

means visible, not the ends. Performance, program, and policy accountabilities concern the ends achieved and imply some means of measuring goals or expectations in precise terms (Stewart, 1984, 13-34).

Giddens discusses accountability in terms of what is normal and expected. Yet, he also examines what passes for accountable and the reasons for deviating from the normal and expected.

The idea of 'accountability' in everyday English gives cogent expression to the intersection of interpretative schemes and norms. To be 'accountable' for one's activities is both to explicate the reasons for them and to supply the normative grounds whereby they may be justified. (Giddens 1984, 30).

Giddens also acknowledges, though, that this intersection is continually changing and evolving.

For example, Sim Sitkin describes the implementation of a new electronic collaborative system to facilitate work among geographically dispersed groups within an organization. In an effort to bring together different parts in this effort, a small group developed a white paper to explain the new system and seek greater input into its future development. However, in that specific corporate culture, white papers were viewed as definitive and well-developed documents that reflected established criteria, not mutable procedures. The response to the white paper was the exact opposite of that intended by its preparers. The genre signaled certain cultural norms and expectations concerning what process should be enacted or invoked to deal with the document. In this case the cultural and historical form of accountability could not change to accommodate a different use and that use failed to achieve its purpose (Sitkin 1994).

According to John Roberts, accountability is more than a reporting system and there are more forms of accountability than hierarchical. He cites a socializing form of accountability that emphasizes reciprocal relationships, mutual understanding, and interdependencies (Roberts 1991, 367). "Accounting can be seen as a particular structure of meanings..., as the basis upon which the significance of organizational events is negotiated and defined, and as the vehicle for the enactment and reenactment of particular relations of power (Roberts 1996, 41)." It is this last element, power, which is significant. Power relationships between people, between organizational functions, and between organizational processes can be significant and important in how accountabilities are valued. This can be particularly significant if the ability to maintain differing accountabilities conflicts in organizations.

Finally, standard operating procedures and routines are also mechanisms for ensuring accountability in organizations. Standard operating procedures identify the locus of accountability for some actions, interactions, and inactions. As such, they identify the loci as well as the boundaries of accountability and accountability relationships.

The availability of formal procedures does not directly ensure that they will be followed but it does not make explicit accountability for actions (or failure to act), which lead to a failure. If the action was prescribed, the actor is not accountable and the person who wrote the procedure is. If the action was prescribed, the actor is accountable (McCarthy, Healy, Wright, Harrison 1997, 738).

The literature of records professionals, such as archivists and records managers, focuses on how accountability is achieved through recordkeeping. This contrasts with the

previous literature that looks at accountability as more of a process. In fact, one author states “archives and records management share a simple goal: providing for organizational accountability (Bearman 1993, 14).” There are significant differences between the archival and records management literature and the research cited above discussing accountability in more sociological terms. While archival authors note the importance of organizational culture in creating accountable recordkeeping systems (e.g., Bearman 1993, McKemmish 1993), achieving accountability in recordkeeping systems is seen in terms of codified warrants (e.g., McKemmish 1993, Iacovino 1993) or electronic systems that incorporate recordkeeping rules aimed at ensuring accountability as well as long-term authenticity (e.g., Duranti, MacNeil, and Underwood 1996 and Gilliland-Swetland 1999). The difficulty of this warrant-based approach to achieving accountability through recordkeeping in actually changing organizational culture and recordkeeping practices is noted.

Thus, in Victoria, where there has been a relatively strong legislative base for a records management role, this has been subverted by administrative action on the part of a hostile Executive. The archival authority has been unable to bring about change in poor recordkeeping cultures in a number of key government departments (McKemmish 1993, 18).

The systems-based approach has also been shown to have drawbacks and often results in the development of homegrown workarounds or shadow recordkeeping systems (e.g., Bowers, Button, and Sharrock, 1995).

The limitations of external warrants to alter the social system and underlying practices should be a major concern to archivists. Archivists have recognized the need for a more thorough understanding of these dynamics

...one based firmly in an understanding of the nature of recorded information created in the context of social and organisational activity, grounded in our traditions but relevant to our time, one that recognizes the role of recordkeeping in our society and the relationship between organisational and recordkeeping culture (McKemmish 1993, 21).

This article is a first step in this process. Its goal is to better understand the social construction of accountability and how this is reflected in the recordkeeping practices in one setting. As noted above, the area of radiology will be examined, particularly the processes surrounding the construction of a radiological report. This next section will look at the historical and social context of the report, the process through which reports are created, the radiological report as a genre (its warrant, form, and language), and the social significance well as the social meaning behind the form. The extended example of radiology also demonstrates how formal accounts (narratives) as well as accounting systems are embedded in frameworks that make them meaningful.

2. The Case of Radiology

Historical and Socio-Political Context of Radiological Accountability and Reporting

The determination of what radiologists would be accountable for was not always a given. Radiologists' accountability is inextricably tied to their work responsibilities and the artifacts that have evolved as evidence of that work. Joel Howell cites two areas that radiologists identified early on as important symbols of status and identity for their

emerging profession. First, since radiology was often confined to basement areas and unseen, radiologists developed a requisition system. Requisitions were created to demonstrate the increasing number of radiological studies being done in the hospital, and as an extension, they documented the importance of radiology. Second, radiologists desired to be viewed as more than mere photographers and worked to establish themselves as the authoritative interpreters of the films. As a result, radiologists successfully argued for payment systems that reimbursed them for their interpretations of an image study, i.e., the creation of a radiological report, rather than for the production of the radiographic picture. By doing this, radiologists established a precedent that linked payment to intellectual expertise. These centers of accountability: the requisition and the radiological report remain in effect today and provide an example of Garfinkel's (1967) argument that accountability is the nexus between alignment and identity work. In spite of these early and largely successful attempts to be seen as masters of the technology and as the sole expert interpreters, radiologists still struggle for control of both the technical mastery of the imaging machines (Barley, 1986) as well as over the importance of their expertise (Larkin, 1978).

Accountability is not simply the records generated in a radiology department, but as Munro (1996) notes the result of an accountability process. In this case, both the interpretation of the radiological films and dictation (actually creating the radiological report) processes are bounded by the generation of records. A radiological requisition begins these processes and a signed radiological report signals its completion. During the course of the interpretation of an image, other records and information are created and used. These records include: the new images, indexes to displayed images, preliminary

book entries, prior images, previous reports, and various temporary notes which radiologists make for themselves. Requisitions and reports are the most universally identifiable artifacts in the radiological context. Since requisitions as agents for accountability have been examined elsewhere (Symon, Long, & Ellis 1996), this paper focuses on the creation of radiological reports.

Radiological Interpretation and the Creation of the Report

Accountability in the radiological setting is constructed by both controlling the interpretation / reports creation process as well as by establishing boundaries for acceptable content. In Kearns's (1996) terms these elements form part of the "accountability environment." At the research site, the interpretation and dictation of the report began after a radiologist had checked all the contextual information (noted above) needed to interpret a study and understood the images. Stanley Raffel notes that the relationship between reporting and the hospital bureaucracy is complex. Namely, ensuring the reliability of records is difficult. As a result, most organizations focus on the reliability of records creators (Raffel, 1979). Charles Bazerman argues that texts represent the worlds in which they were created and thus reflect different types of accountabilities (of both degree and kind) (Bazerman, 1988). In health care institutions, four methods of accountability are used:

- (1) Restricting the 'privilege' of record-writing to professionals and semi-professionals.
- (2) Imposing legal and other kinds of sanctions on record-writers.
- (3) Instituting review procedures, and
- (4) making bureaucratic tasks concurrent with medical tasks (Raffel, 1979, 91).

Raffel's accountabilities were instantiated in the following manner at this site. Radiological reports were then spoken into a telephone dictation system. Reports began life as an audio dictation over the telephone system. This was then transcribed into the electronic radiological information system (RIS). The dictating radiologist then reviewed the reports and either amended on-line or signed with an electronic signature. Only certain individuals could dictate reports. These individuals were supervising or attending radiologists, radiological fellows (5th year residents), and residents. Most reports completed by the fellows and all of the residents' reports had to be cosigned by the attending radiologist. In order to enter the system, the radiologist, fellow, or resident had to state his or her name and doctor authentication number. Fellows had two authentication numbers, one used when they were supervised and one used when they dictated in an unsupervised setting. In this instance, the answer to Eisenberg's (1993) question concerning who is accountable to whom is conditional based on the presence of certain actors and particular events. These interlocking and conditional accountability relationships provide an example of the interconnected levels of accountability noted by Stewart (1984).

Catherine Pettinari (1988) cites three other potential purposes or accountabilities of medical reports, specifically surgical reports. These are communication between professionals in the health care setting (patient care, short term), documentation of an event for the purposes of organizational memory or legal reasons (administrative use and patient care, long term), and some combination between these two aspects of reports. Radiological reports also needed to support a diverse array of activities in a medical center: clinical, educational, and administrative. The resulting tension between

administrative and clinical information work is also discussed by Phyllis Ngin (1993). In her study, Ngin notes that nurses developed informal recordkeeping practices to satisfy the differing needs of bureaucratic accountability and patient care. In this way, recordkeepers often experience strain in creating records to support multiple functions. Furthermore, radiological reports are required to be resilient over time, particularly for the radiologists themselves who later use the reports to aid in the interpretation of subsequent radiological studies. As a result, many radiological reports may be written for the radiologists themselves and another tension, between clinicians and radiologists, may arise. In this way past and present accountability actions serve both as intermediaries in the accountability process as well as evidence of it. The use of prior reports and images demonstrates one means by which past evidence of accountability becomes a condition for future action (Munro 1996).

Radiological reports were shaped by internal and external professional guidelines, bureaucratic needs, and departmental practices. This mix of warrants may demonstrate Friedrich and Finer's balance between internal and external controls. The combination of administrative, professional, and social warrants came from a variety of formal and informal sources. These influences affected both the form as well as the content of the dictation and the report. Radiological reports were fairly standardized in form and content. At the site, radiologists were instructed to create reports according to the schema presented in the following undated memo:

Figure 1: Untitled and Undated Internal Memo on Dictation Format

DOCTORS PLEASE USE THE FOLLOWING DICTATION FORMAT:

1. BARCODE (KEYS CAN BE USED) DICTATING DOCTORS ID
(must be 6 digits)
2. BARCODE (IF NO REQUISITION - KEY IN 8 DIGIT PATIENT ID
DICTATE REQUISITION #)
3. DICTATE THE SUPERVISORS ID# AND NAME.
4. DICTATE THE PATIENTS NAME
5. DICTATE THE TEACHING/QUALITY ASSURANCE CODES
6. DICTATE THE TYPE OF EXAM FOR THE BARCODED
REQUISITION.
7. DICTATE OTHER REQUISITIONS TO BE INCLUDED IN THE
REPORT AND THE DATES AND TYPE OF EXAM
8. DICTATE THE CLINICAL HISTORY
9. PROCEDURE
10. FINDINGS
11. IMPRESSION

The preceding instructions for radiological reports summarized the guidelines provided for the content of diagnostic communications that was encoded as a standard by the American College of Radiology (ACR) (ACR, 1995). Several pieces of information in the ACR guidelines, such as name of the referring physician and patient birth date were omitted at the research site. Most significantly, the parenthetical instructions defining the different elements provided in the ACR standard were not given locally. This indicates that the content of different form elements was more tightly culture bound and that definitions for were not formally encoded but comprised informal practice at the research site. Roberts (1991) argues that accountability is comprised of mutual understandings and a common structure of meaning, these tacit definitions provide further evidence for his statements.

The radiological report is one genre of medical reports. As other types of medical reports that contain recognizable narrative elements (Hunter 1991), the radiological report follows a generalizable pattern. As such, it tells a story and encompasses both meanings of account in the dictionary. It is both a story and an account that must be balanced with other information. Reports at the medical center followed a common pattern. A typical report consisted of the following elements: Identifications, Background, Findings, Impressions, and Closing. Alongside the pattern is the transcription of an actual ultrasound imaging report.

Report Sections	Actual Report
<p>A. Identifications</p> <ul style="list-style-type: none"> • The radiologist, fellow, or resident’s name and ID number • Identification of attending radiologist (if applicable for fellows and residents) • Requisition number • Patient name and number 	<p>Williams² [resident] and Rodriguez [attending radiologist],</p> <p>Req number x</p> <p>Patient [name], number x.</p>
<p>B. Background</p> <ul style="list-style-type: none"> • Requisition reason or clinical question • Type of radiological exam performed • Date and time of exam performed 	<p>Exam: Right upper quadrant ultrasound/Doppler.</p> <p>Clinical information: Blood in stool. Check patency of TIPS³. Cirrhosis⁴.</p>

² The names of all radiological personnel have been changed and pseudonyms. The same pseudonym is consistently used for an individual.

³ TIPS examinations in ultrasound assess the amount of blood flow to and from the liver.

<p>C. Findings</p> <ul style="list-style-type: none"> • Existence of prior radiological examinations used for comparison • Point by point description of pathological findings 	<p>Findings: Comparison 4-14-95. The TIPS in the right hepatic lobe remains patent. Time averaged peak velocities⁵ range from 80-90 centimeters per second previous measuring 72-89 centimeters per second. Although velocity is similar to the prior exam, flow has decreased in velocity since 2-95 (95-105 centimeters per second) and since 8-5-94 (150-171 centimeters per second). Normal hepatic arterial signal. Appropriate flow within the hepatic venous system. Patel pedal flow within the main portal vein, right portal vein, and left portal vein as on the prior exam. Shrunken nodule liver consistent with cirrhosis. Left kidney measures 12.2 centimeters, right kidney measures 11.8 centimeters, no hydronephrosis. Enlarged spleen measures 16 centimeters. Multiple gallstones, no gall bladder wall</p>
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⁴ Cirrhosis is a chronic degenerative disease of the liver. It is characterized by decreasing blood flow, among other symptoms.

⁵ Velocities refers to blood flow.

	thickening. No intra or extra hepatic biliary dilatation ⁶ , common hepatic duct measures 5 millimeters. No free intraperitoneal fluid.
D. Impressions or summary conclusions of the findings	Impression number one: Patent TIPS. No significant change in peak flow velocities since 4-14-95.
E. Closing <ul style="list-style-type: none"> • Signature(s) "end signed" fellow/resident and radiologist or just radiologist • Utilization review code 	End Williams and Rodriguez code number one.

This report contained all of the standard elements of a radiological report. Identifications were provided in line 1. The initial line identified the resident (Williams), the attending radiologist (Rodriguez), and the patient. Background information on the type of ultrasound imaging exam, “right upper quadrant ultrasound / Doppler” (line 2), the clinical question, “check patency of TIPS. Cirrhosis” (line 3) was also present. Findings noted specific comparisons with prior images from April. However, as one reads further in the body of the report other studies were used to show marked change over time. The

⁶ Biliary dilitation refers to an enlargement of the gallbladder or bile ducts.

resident went on to note all significant pathological features. The most significant findings were supposed to be listed first. Overall, the findings did not refer to specific image features. Hedging language was apparent in the phrase, “Shrunken nodule liver consistent with cirrhosis” (line 11). Impressions summarized the findings and specifically addressed the “questions to be answered.” These were phrased as number 1, number 2, etc., but in this case there was only one impression. Closure was brief and to the point. The name of the resident and the radiologist was reiterated and a review code was selected.

A typical report from chest radiography was briefer than one from ultrasound. This demonstrates that reporting norms and what is necessary for accountability can be interpreted differently even among radiological modalities at one site.

Paginini dictating req number x [patient name] number x.

Exam portable chest. Intubated⁷, rule out infiltrate⁸.

Impressions, one: Comparisons made to a previous exam dates 8/20/95

Two: End of tracheal tube, feeding tube, esophageal catheter, and right sided central line with its tip in the region of the right atrium all remain in place.

⁷ Intubated signifies that the patient has some type(s) of tube(s) inserted into the body. In this case, a tracheal tube assists breathing, a feeding tube and esophageal catheter supply nutrition and withdraw excess fluids, and a central line in the right atrium monitors the heart.

Three: Diffuse increased opacity⁹ is seen throughout both hemi-thoraces¹⁰, which appears to have progressed when compared with the previous exam. These findings can be secondary to increasing bilateral pleural effusions¹¹. [inaudible] Air space disease¹² cannot be ruled out. The possibility of infection or edema¹³ should also be considered. Clinical correlation and continued follow-up are suggested.

Number four: The exam is otherwise unremarkable.

Please give this exam a utilization code one. End Paginini.

In chest radiography, the practice was to provide impressions only, and not to dictate lengthy findings. This practice was preferred by the head of the division (IP Chest 8/3/95, Cavanaugh). In the dictation above, the attending radiologist noted identification information (line 1), background (line 2), listed fairly extensive impressions for chest radiographs (lines 3-14), and concluded (line 15). The radiologist addressed both portions of the clinical question (line 2). In relation to the “intubated” indication, he

⁸ Infiltrate is fluid in the lungs.

⁹ Opacity denotes a visual analysis of the lung becoming more opaque.

¹⁰ Hemi-thoraces are sides of the chest corresponding to the left and right lung lobes.

¹¹ Pleural effusions are an abnormal accumulation of fluid in the intrapleural spaces of the lungs.

¹² Air space disease is an infection in the alveolar ducts, alveolar sacs, and alveoli of the respiratory system. The alveoli are small outpouchings of walls through which gas exchange takes place between the air and the blood in the lungs.

noted the position of all lines and tubes inserted into the patient for breathing, feeding, and monitoring of vital signs. In response to the question to “rule out infiltrate,” the radiologist hedged by noting “clinical correlation and continued follow-up are suggested” and provided a list of possibilities or differential diagnoses rather than a direct answer.

Each radiological report contained a utilization review code, referred to above as "code number one." The review codes provided a means of accountability through for radiological and administrative review of the appropriateness of a particular radiological study. Another undated internal memo, posted in all radiological reading rooms, details the utilization review codes employed in the medical center:

Figure 2: Utilization Review Codes

Utilization Review (U.R.) Codes Listed at the End of Dictations:

1. Positive results with exam appropriate to complaint.
2. Positive results with exam not appropriate to complaint.
3. Negative results with exam appropriate to complaint.
4. Negative results with exam not appropriate to complaint.
5. Equivocal results or inability to determine appropriateness.
6. Equivocal results recommend additional exam.

The U.R. codes are a form of accountability and are particularly interesting because the radiological results were categorized according to their relationship to the complaint or stated reason for the exam, as stated by the ordering clinician. Thus, the

¹³ Edema connotes an abnormal accumulation of fluid in the interstitial spaces of tissues.

radiologist must judge the clinician's reason for ordering an exam as either appropriate or not in relation to the findings and type of radiological exam completed. This is done to ensure correct testing for both economic and clinical reasons.

A closer look at the contents of radiological reports at the research site helps to demonstrate how social norms can creep into the formal reporting structure. Furthermore, a closer examination of the construction of the contents of reports provides more insight into why the standard radiological reporting system, while accountable, often fails to satisfy clinicians' information needs. Renee Anspach (1988) cites four characteristics of case presentations: 1) depersonalization or the use of demographic descriptions (e.g., 51 year old female), 2) use of the passive voice, 3) treating the technology as agent (e.g., ultrasound showed lack of portal venous flow), and 4) using the patient's rendition of symptomatic history as hearsay (Anspach, 1988). The first three characteristics were also found in radiological reports and require further discussion.

Depersonalizing human patients and anthropomorphizing technology were standard in radiology reports as well as in consultations. In ultrasound, radiologists were often unable to recognize a patient's name, but readily remembered a type of study done or some salient anatomical feature. Use of the passive voice caused greater ambiguity for clinicians. According to Anspach (1988), passive voice also mitigates responsibility. Kathryn Hunter asserts that medical practitioners were not reflective about the construction of reports (Hunter 1991). However, one attending radiologist was very eloquent on the topic of dictations and spoke with residents several times about use of the passive voice as well as dictation clarity and style. This following passage is particularly

interesting because the attending is essentially teaching the residents how to be accountable and create better dictations and reports.

My recommendation is use positive reports and active voice rather than passive voice and speaking in negatives. Active voice are active statements, cardiac enlargements are an active statement. If you read a report that has multiple passive statements, it is a very difficult report to read. There is normal heart size, there is poor aspiration, there are...try to use active voices if you can. Also, speak in terms of positives, whenever you can rather than negatives. What do I mean by that? Pneumonia can't be excluded, what you mean is pneumonia is a possibility. So it's the same thing, but can't be excluded is a double negative, it's a very poor use of language. So, for example, no consolidation what you mean is lungs are clear (Cavanaugh, In-patient Chest Radiography, 7/24/95).

In addition to passive voice, depersonalization, and using technology as an agent, the radiological reports also featured three other characteristics: hedging, parsimonious reporting, and problems of language specificity, of which the use of double negatives, noted above, is just one symptom.

Hedging was used to reflect uncertainty or the lack of the ability of radiologists to confirm or disprove clinicians' suspicions. Hedging included a wide range of linguistic mechanisms to qualify or limit statements (Prince, Frader, & Bosk, 1982). For example, a neurologist noted that reports often contained the "radiologists' dodge" and he cited the phrase "clinical correlation is advised" (Neurologist, 11/22/95) that is present in a

dictation quoted above. This informant noted that in ambiguous cases where hedging was used, he initiated a consultation in order to get a sense of the radiologist's index of suspicion. Another form of hedging occurred when the radiologist provided a list of potential differential diagnoses (Bitretti & Zimmerman, 1992). For example in one encounter a radiologist stated, "it could be early IUP¹⁴, failed IUP, residual loss or ectopic. Any of this could be (Dr. Brown, Consult 86, lines 134-135)." Hedging language could be used unconsciously or consciously. On one occasion, a radiologist specifically advised a fellow to use hedging in the report because of the lack of old films for comparison (Cavanaugh, Intensive Care Unit Chest Radiography 8/25/95).

Parsimonious reporting was a decision not to describe non-life threatening features that radiologists' deemed irrelevant to the clinical questions. Radiologists did this to avoid follow-up questions from clinicians. In the following excerpt, a fellow explained this philosophy to a resident.

Bancroft See the whole liver is kind of echogenic and continuing.

[Points to image].

Williams Is that duplicated? [Points to an image of a kidney]

Bancroft I have adopted the [a staff radiologist's] stance of not mentioning that, um...

Williams Because it is going to be normal.

¹⁴ IUP is an intrauterine pregnancy.

Bancroft Well, because it essentially is unless one of them is dilated. Because it is essentially a normal variant. And I had one clinician call me back and say so she's got a duplicated kidney, what is the significance of having an extra kidney. And I had one patient tell me she had [pause] three kidneys

Williams Three kidneys.

Bancroft So, now I don't mention it anymore. (Ultrasound Imaging, 6/8/95)

The consequences of mentioning “unnecessary details” in a report were interruptions. In one instance, two separate telephone consultations resulted from the mention of small size kidneys. In the first consultation, a resident reported, “the report is small size kidneys, otherwise negative” (Consultation # 29, line 5). This led to a discussion of precise sizes of the two kidneys. In the second consultation, another resident again reiterated the sizes and tried to downplay the finding, “so, I mean, just on the small end of normal” (Consultation #31, lines 27-28).

Language specificity is a problem in patient records and radiological reports are no exception (Mattison, Gregory, & Linde 1995). While the radiologist quoted above noted that double negatives were confusing, actual definitional differences among radiologists and between clinicians and radiologists were also evident. The same radiologist stated, “you see [naming another radiologist] does not distinguish between air space opacity and lung opacity [atelectasis] but he's wrong.” (In-Patient Chest Radiology

7/24/95, Cavanaugh). Later, the radiologist quizzed a resident, “how do you handle terminology?” when demonstrating the difference between lung volumes and inflation levels (In-Patient Chest Radiology 7/24/95, Cavanaugh). Medical terminology is not standard across medical specialties. The lack of standardization created further ambiguity in reporting. A rheumatologist noted that the term osteopenia was used much more specifically by rheumatologists than by radiologists. For this rheumatologist, the language in reports was critical since many of the cases involved workmen’s compensation issues and the reports automatically became evidence in court (Rheumatologist, 11/22/95). Likewise, one radiologist discussed this problem with regard to the term “ileus,” which was a type of intestinal obstruction.

The term ileus is one also that I use with caution. Um, that uh, one I had, I was presenting at a mortality conference, a surgical mortality conference, and I said this shows ileus and a surgeon, in fact several of them stood up and said that what we [radiologists] call ileus, it's not ileus. When they listen to the patient there's [inaudible], peristalsis all over the place. That what you see is non-obstructive dilatation, but it may not be ileus. So I just call it non-obstructive dilatation. Uh, there was an article that came out maybe a year later that they say the only way to make a diagnosis was to take two supine views five minutes apart and if the gas did not move around then you could call it ileus. Meaning adynamic, but otherwise you can't say it's adynamic ileus (Intensive Care Unit Chest Radiography 8/25/95, Cavanaugh,).

Medical terminology is also culturally specific. One afternoon, a conversation between a multi-national group of residents and fellows was observed. The group discussed abbreviations on requisition forms and common usage they heard around the medical center. Even the most familiar terms were new to some of the fellows and residents, even to the native English speakers from other countries. For example, a fellow recounted the story of his first weekend when he covered the radiological service and was approached by a resident from “ER.” Even a term like ER that is familiar to lay people in the United States was foreign to the fellow. Furthermore, many medical abbreviations have several meanings, so knowledge of the context is essential for understanding. Interestingly, even a native English speaking radiologist from the United States exclaimed when discussing reports, “no abbreviations...I see lots of abbreviations I have no idea what they are” (In-patient Chest Radiography 8/3/95, Cavanaugh). Language selection and content does have an impact on present and future understandability of radiological reports for radiologists as well as clinicians.

Hedging, parsimonious reporting, and language specificity were three ways that radiologists used to create conservative and risk-averse reports. Following Kearn’s (1996) ideas, the radiologists created their own cultural norms and expectations concerning public responsiveness and accuracy in reporting. These social rules regarding report dictation had different motivations. Hedging is conjectured to be a response to administrative accountability and pressures to be cautious and avoid law suits. Burnum (1988) notes the presence of the conservative trend in medical records in general. He attributed this to the loss of confidentiality in medical records that are now open to insurers, administrators, and many physicians. Burnum also argues that litigiousness in

the society has resulted in changed forms of information selected to be included in the record. In radiological reports, language usage employed a number of elements that led to ambiguity and uncertainty for clinicians. Parsimonious reporting, however, can be attributed to social norms and more local accountability pressures in the radiological reading rooms. Parsimonious reporting was done to avoid questions from clinicians and therefore create a less disruptive working environment. More questions from clinicians caused work to back up (e.g., uninterpreted radiological studies and increasing numbers of patients waiting). Language was used as a means of resolving conflicting accountability structures within the strictures of formal and informal, external and internal forms of warrant.

Anspach revealingly noted the differences between oral and written communications in medical environments.

Oral presentations are private affairs open only to physicians. In the written case record, however, the ambit of evaluation widens. Not only is the case record open to evaluation by other physicians; potentially it can become a public record in malpractice suits. In view of the salience of malpractice in medical culture, the rise of so-called “defensive medicine,” and the demand for documentation and the use of diagnostic technology, a language that treats findings as unproblematic and minimizes the responsibility of physicians for decision making has the effect of protecting those who use it from public scrutiny (Anspach 1988, 370-371).

This quotation by Anspach demonstrates a salient difference in oral and written communications and how different venues of interprofessional communication in a health care facility may elicit greater or lesser degrees of latitude in language, explicitness, and

candor and yet create an accountable record. Conservatively worded reports, though, become a source of ambiguity for clinicians. At times, this ambiguity may fail to arouse a clinician's index of suspicion and the clinician may fail to take appropriate measures.

In a teaching hospital, such as the one under study, radiological reports created by residents were also continual tests of accountability in terms of both competency and evaluation. Each report provided an opportunity for controlled or supervised tests in which residents demonstrated accountability to the supervising radiologist *ex ante* as well as *ex post*. Richard Laughlin defines *ex ante* accountability as providing information on what and how one is going to perform a task and *ex post* accountability as evidence that the action has been completed (Laughlin 1996, 228). In essence, residents must account according in both narratively as well as by providing their best estimation of the underlying problem in creating a report.

During observations, radiologists assessed the residents' diagnostic reasoning during an initial viewing of the images when residents provided the attending radiologist with a summary of their report. This was referred to as "staffing out." In this phase, residents had to demonstrate that they understood the salient features in a study, could identify any emergent findings, and were cognizant of the correct terminology. Second, the report invisibly reflected the resident's ability as well as the critique by the attending radiologist during staffing out. The resulting report was also checked at the end of the process by the attending radiologist before signing it and therefore also served as a means of evaluating residents. As a result, the report played a large role ensuring accountability in medical education.

Conflicting accountabilities

The multiple accountabilities of the process and the content, various purposes of radiological reports as well as the numerous audiences that they were supposed to serve creates tension within the radiological interpretation and reporting processes. These tensions occurred due to both the process and the content among medical personnel as well as between medical personnel and administrators. Internal and external accountabilities were not always well balanced.

Perrin and Perrin (1991) note that patient care and educational goals sometimes conflict. Conflicts were evident in this study, the two-step signature process for radiological reports, particularly when the resident had to sign off on a report and then the attending had to co-sign, added time to the interpretation and dictation process and was one way the process was slowed down.

As noted above in the Sitkin's example of the white paper, how social systems respond to records of accountability differs, or perhaps what is considered to be accountable differs. As was implied throughout this section, the uses and users of radiological reports were diverse. Radiological reports were used by clinicians in the diagnosis and treatment of patients. However, the official radiological report often failed to satisfy the clinical needs of physicians even as it satisfied the legal requirement for evidence and became part of the patient record. Part of this problem may be that radiologists' and clinicians' goals are different. Radiologists seek to give comprehensive, accurate, "accountable," readings of radiological studies. Clinicians seek to treat a patient's medical problems and are often confronted with diverse or conflicting medical evidence. For example, a rheumatologist noted that she specifically uses reports as a screening mechanism to determine which cases required further discussion at a

conference with radiologists (Rheumatologist, 11/24/95). In this case, the report served as a signal for further action.

The quotations from clinicians throughout this paper indicate that radiological reports signified different things and provided differing types of accountability to various medical personnel. Barbara Czarniawska (1997) raises a related issue that is germane to radiological reports. In the municipalities she studied, people used the budget processes and the documents generated as a pretext to talking to one another. However, in the insurance offices where she did research, budget-related texts were used to replace conversation. The rheumatologist cited above definitely uses the reports as a pretext to talk. Likewise, the tactic of using the report as a baseline for further discussion was used by a neurologist, who employed further consultation to help radiologists “rearrange impressions when faced with history and other contextual information” (Neurologist, 11/22/95). How clinicians and radiologists view the "accountability relationships," to borrow a phrase from Munro, between the radiological report, the patient, and their respective medical domains requires further investigation.

Although it was generated by a radiologist, the radiological report had an extended life. The production of the final, signed report signaled the administration that the radiologist could be billed for his or her work. The radiological report thus embodied various accountabilities within radiology as well as external to radiology. Radiological reports assist clinicians in patient care, provide the basis for the process of educating radiological residents and medical students, and aid administrators in different billing and evaluative processes. These accountabilities did not always work in sync and often conflicted in the radiological report. The result of these strictures was often ambiguous,

conservatively written reports with no clues as to the radiological reasoning or the strength of a radiologist's ambivalence.

Accountability in recordkeeping systems and practices is often used in the singular. However, this study demonstrates that multiple accountabilities exist in both recordkeeping processes and in the records themselves. Sustaining and balancing these accountabilities can be difficult and lead to compromises. To understand accountability, one must examine the entire accountability environment and the various warrants, both codified as well as those embedded in practice. To return to one of the early points in this article, it therefore becomes critical not only to understand the artifact of accountability (the radiological report) but also to understand the historical, social, and organizational context of the recordkeeping process that sustains the radiological report. Furthermore, thinking about accountability as both a process and as an outcome provides two separate means of assessing different measures of risk and benefit. The accountability model may also form a basis for selecting policies, standards, or technological design solutions depending on how accountability is constructed and enacted in a given organization.

Accountability works on two levels: organizational and individual. Research in this area tends to examine the organizational mechanisms. But this study points to the dynamic between the individual and organizational levels that is required to make accountability robust and work. In focusing on the residents, accountability is developed through socialization and the taking on of a professional identity, learned through communities of practice, and finally understood through years of experience. On both the organizational or the individual level, accountability must be internalized.

Organizationally, accountability is encoded through standard operating procedures and

routines. Individually, accountability must become part of one's procedural knowledge (Singley and Anderson, 1989) even though in the case of radiological education one radiologist, in particular (Cavanaugh), was able to clearly articulate the bounds of reporting accountability for residents. What this means for the implementation of new technologies is that while one can design and implement accountable mechanisms in electronic recordkeeping systems, to become truly part of routine organizational practice, accountability must be accepted on a much deeper procedural level.

Accountability is a complex issue that cannot be understood simply by examining recordkeeping systems, standard operating procedures, regulations, manuals, and other documentation describing how the work should be done. Understanding accountabilities entails studying the underlying technical, social, and cultural processes. The construction of accountabilities is also based on ethics and values. John Roberts argues that accountability in organizations is aimed at the strategic or instrumental consequences of action; however, in a deeper sense accountability also includes a moral dimension that may not best be served by systems of organizational accountability (Roberts 1996, 40). Accountability may be a start, but it is not the final answer.

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