

FINDING THE SIGNS: MAPPING PATIENT/CLINIC NARRATIVES

ABSTRACT:

Bureaucratic processes in healthcare, while necessary, may inadvertently and negatively affect the positive wellbeing of a patient's health. A patient must be an active participant in their own healthcare for it to remain effective, yet bureaucratic process and medical terms may leave them confused and disconnected from their own care. This paper will describe and analyze through maps and qualitative analysis, the documents that are part of the bureaucracy within a university student healthcare center, identifying factors that could cause confusion within its initial documentation for new students. Through visual analysis of these inherent bureaucratic processes, and identifying unintended visual and procedural messages, there exists the potential for improving healthcare patient participation and dialog between the patient and caregiver.

KEYWORDS

Information design, healthcare, mapping.

I. OVERVIEW

The bureaucratic processes that surround and are embedded in healthcare can inadvertently circumvent the good intentions of both the patient and the doctor in improving health. A medical facility deals with these processes on a daily basis, while a patient may only encounter them when they are not well, and perhaps at their most vulnerable due to misperception, and potential misreading of the intention of these documents and forms. There may be many communication barriers for the patient and clinician in this atmosphere, one of which could be defined as 'professional vision' "...socially organized ways of seeing and understanding events that are answerable to the distinctive interests of a particular social groups." (Goodwin 2002). A condition where each party involved may view the same situations through their own lens based on their own expertise and experiences, and potentially draw very different conclusions based on the information at hand.

Though these bureaucratic processes may be necessary, they may produce undue stress, confusion, redundancy, and potentially communicate unintended signals for the patient. In this potentially unfamiliar environment, they may be unwilling or unable to assist in their own care due to environmental and cultural values that obscure their true needs as they navigate a seemingly endless pile of forms. These administrative and orderly tasks may serve a logical and necessary role; nevertheless they may be interpreted as devices of control (Frascara 2000), potentially making the patient feel that they are outside their own care process.

The following paper begins by describing the existing situation, the forms examined, and the context of those forms (such as where they are to be found and when). The design of the individual forms is analyzed, critiquing their look, content, and task structure, pointing out design issues, concluding with possible solutions and future directions for further research.

2. DESCRIPTION OF EXISTING CONDITION

Upon entry into the Thielen Student Health Center (TSHC) on the campus of Iowa State University (ISU), a visitor is immediately greeted in the middle of the entry hall with a paper sign stating "Wait Here Until Called." This simple and perhaps innocuous message sets the tone of a patient's visit, some may bypass the sign (deliberately or inadvertently), and approach the reception desk and be potentially admonished for not waiting. Perhaps a visitor may stand at the sign and feel odd doing so since there is obviously no one ahead of them. Though this sign is clearly intended as a simple method of control, for example keeping potential crowds of students away from the desk where they may overhear the private information of other patients, it may also inadvertently make patients feel ill at ease.

Next to this initial sign is a small table containing brochures, a small upright container filled with stapled white pieces of paper that have flopped over and thus impossible to see or notice, are Health History Forms. A new patient will have presumably filled this form when they first enrolled, though the clinic does ask that this be updated on a yearly basis, or if any conditions have changed since it was last filled out. If a student should happen to notice this form and intend to fill it out, the table is too small, and impossible to write on (if a pen can be found). Possibly they'll be asked to update this form once they speak to someone at the front desk, and fill out the form in the waiting area. Which leaves open the question, why bother having the forms at the table if no one may see them, much less know what they are? Will they be required to return to the table and retrieve a form? How would this situation make a patient feel? Not only did they possibly not wait at the table, they may have failed to see the form they needed to fill out.

Currently, TSHC is implementing a completely computerized healthcare communication system. This system integrates all components of student healthcare scenarios, such as scheduling and records. However, at this time this system does not include the integration of forms that students (new students in particular) most frequently need to fill out. Currently, these forms are available at TSHC, and through its various activities (particularly new student orientations), but the most heavily used distribution point is the web site. In fact, the web site is the only option available for a new student (Figure 1.) to obtain these forms after they receive their first contact from the Health Center in the form of a letter and the Checklist for Requirements. However, in a recent survey of 93 ISU students, part of a larger study of TSHC, of which this paper is part, 56% of respondents reported hearing about the center during orientation, and 31% reported first hearing about it through the mail (Design Information Research Group, student survey, summer 2007). Each of these forms can be found through a list on the first page of the web site as both .doc (Word format) or as a .pdf file. This "Checklist for Requirements" first requires that three forms (these will be referred to as the Checklist Forms) be downloaded: Immunization Requirement Form, Health History Form, and Insurance Form.

Once these forms have been downloaded, there are a series of bulleted points that need to be accomplished in order to complete this portion of their enrollment at ISU. These points include documenting dates of immunizations and illnesses by photocopying, writing in dates, or receiving signatures from their current physician.

**Iowa State University
Thielen Student Health Center
Checklist for Requirements**

Please use this checklist to assist you in making sure that all of the required information is completed and sent in to the Thielen Student Health Center. If you have any questions, please call 515 294-5801 and ask to speak with the immunization nurse.

- Download forms from Web site: www.public.iastate.edu/~health/homepage.html
 - ▶ Immunization Requirement Form
 - ▶ Health History Form
 - ▶ Insurance Form
- Complete Immunization Requirement Form
 - ▶ Include two (2) measles immunization dates
 - ▶ Answer the questions on meningitis
 - ▶ Have your doctor or nurse sign the form OR attach a copy of the immunization form or card. (Many high schools will provide you with this information.) Please do not send your original immunization documents; keep them for your files.
- Complete the Health History Form (Please review the information with your student)
 - ▶ Have your student sign the form if 18 years old or above
- Complete the Insurance form
 - ▶ Include a copy of the front and back of your insurance card
 - ▶ Have your student sign the form if 18 years old or above
- Mail or fax the forms to:

Iowa State University
Thielen Student Health Center
ATTENTION: Immunization Information
Ames, IA 50011-2260
Fax: 515 294-5892

Figure 1: Checklist for Requirements, the initial health form new students receive via mail.

2.1. IMMUNIZATION REQUIREMENT FORM

Iowa State University only requires proof of immunization or immunity for measles. This fact is noted at the top of the Immunization Requirement Form (Figure 2.). It also notes that the receipt of information about Meningitis or the record of vaccination or non-vaccination is needed. Following this is a statement about Tuberculosis (TB) being required only for non-U.S. citizens.

Iowa State University Immunization Requirement

Return this form to: Iowa State University 2260 Thielson Student Health Center Ames, Iowa 50011-2260
Phone: 515-294-9535 Fax: 515-294-5992

NAME: Last (Family) _____ First _____ Middle _____ Date of Birth: _____ ISU University Identification Number _____

Permanent Address: _____ City, State, Zip _____ Permanent Phone Number _____

Country of Citizenship: _____ Gender: _____ Iowa State University Entrance Date: _____
 Male Female Fall Spring Summer _____ Year _____

REQUIRED IMMUNIZATIONS OF ALL PENDING STUDENTS (including transfer and graduate):
Proof of immunization or immunity is required to register for classes.

➔ **MEASLES (Rubeola) Immunity** Please check one of the four options:

I have had two doses of live measles vaccine:
First Dose _____ Measles, Mumps, Rubella
Must be on or after first birthday Measles, Mumps, Rubella _____ Month/Day Year _____
Second Dose _____ Measles, Mumps, Rubella
Must be given in 1990 or later Measles, Mumps, Rubella _____ Month/Day Year _____
and at least 30 days after first dose Measles _____ Month/Day Year _____

Signature of Licensed Health Care Provider (OR attach that record or documentation) _____ Date _____
PLEASE DO NOT SEND ORIGINAL DOCUMENTS

I have had a Measles (Rubeola) titer (blood test) showing immunity (attach a copy of blood test)

I have had Measles (Rubeola) disease (Health Care Provider documentation of rubeola with date of disease attached)

I am exempt because I was born before January 1, 1957

➔ **MENINGITIS:** Please read the information provided on pages 1 and 4
 Yes, I have been vaccinated Meningococcal (MPSV4) OR Meningococcal (MCV4) _____ Month _____ Day _____ Year _____
 No, I have not been vaccinated

➔ **TUBERCULOSIS (TB) Testing:** Testing is required for all non-U.S. citizens after arriving in the U.S. This will be done on arrival to ISU.

RECOMMENDED IMMUNIZATIONS: Please record date of vaccination. See information on back of form.

Date of last vaccination (month/day/year) _____ Rubella _____
 Mumps _____ Polio (IPV or OPV) _____
 Tetanus/diphtheria (Td) _____ Polio (IPV or OPV) _____
 Varicella/Chickenpox: Dose #1 _____ Dose #2 _____ or Date of Disease _____

Hepatitis A: Dose #1 _____ Dose #2 _____
 Hepatitis B: Dose #1 _____ Dose #2 _____ Dose #3 _____
 Note: If series has NOT been completed, please indicate vaccine used: Engerix Recombivax

Tuberculin Skin Test (Mantoux) - *Non-U.S. citizens*, please see instructions on back of form.
 Positive Negative _____ mm of induration _____ date of test _____

Immunization Instructions

MEASLES REQUIREMENT
 Measles (rubeola) is a serious disease that is entirely preventable. Iowa State University follows the Centers for Disease Control and Prevention's recommendation for immunization. To prevent the possibility of a measles epidemic occurring here, ISU requires that all new (including transfer and graduate) students show proof of immunization or immunity. **If you do not provide this information before September 31st, you will not be allowed to register for the next semester's classes.**

Your immunization records can be obtained from your health care provider's office. They may also be available from your high school or from other colleges or universities you have attended. Public health department and military records are also acceptable. Please note that all immunization dates and tests must include the month, day, and year. A photocopy of your immunization record is acceptable and may be attached to this form. **Please do not send original documents.**

IF YOU NEED A MEASLES IMMUNIZATION
 The Thielson Student Health Center is located on the northeast corner of Union Drive and Sheldon Avenue, just west of Beyer Hall. New students are eligible for vaccinations and other services beginning with New Student Orientation and throughout the summer. Rubella titers (blood test) and Tuberculosis (TB) skin tests are also available. ***TB testing is required of international non-U.S. citizens; students only and will be part of orientation procedures.*** Please note that there will be a charge for the vaccine and tests. You may also visit your current health care provider for a measles vaccination and send the appropriate documentation to the Thielson Student Health Center.

CHECKLIST FOR REQUIREMENTS

Include two (2) measles immunization dates or proof of immunity
 Read the attached information on meningitis
 Answer the questions on meningitis
 Have your doctor or nurse sign the form OR attach a copy of the immunization form or card. (Many high schools will provide you with this information.) Please do not send your original immunization documents; keep them for your files.

DISEASE AND IMMUNIZATION INFORMATION
Hepatitis A: A viral infection resulting in inflammation of the liver, and often leading to temporary jaundice and flu-like symptoms. May be transmitted by food, sexual contact, or in daycare settings. A two-shot series (the second shot is given 6 months after the first) offers up to 10 years of protection. Advised for all travelers to less developed areas and for homosexual males.
Hepatitis B: A viral infection similar to Hepatitis A but with a risk of developing liver cancer and other complications. Generally transmitted through blood or bodily secretions. A three-shot series is given over 6 months and gives 10 years or more of immunity. Recommended for all students.
Polio: After completion of the childhood series, a booster is recommended only for persons planning to travel to less developed areas.
Tetanus/diphtheria/Pertussis: After the initial childhood series, a booster is recommended every 10 years (5 years for those who travel abroad).
Pneumococcal pneumonia: A one-shot vaccination is advised for students with chronic respiratory, heart, or liver conditions, those with sickle cell disease, those over age 65, and those who have had their spleen removed or have compromised immune systems.
Varicella/Chickenpox: A two-shot series is recommended for those who have not had chickenpox.
Influenza: A one-shot vaccine given each year in the fall. Recommended for all students.

WHAT DO I DO WITH THIS FORM?
 After completing this form, mail, fax, or deliver to the Iowa State University Thielson Student Health Center. You may bring the form to orientation and a representative from the Thielson Student Health Center will be there to collect it. **Non-U.S. citizens should bring this form to orientation.** If you have any questions about Iowa State University's immunization requirement, please call (515) 294-9535.

Please keep a copy of this form for your files. Revised 206

MENINGOCOCCAL VACCINES

WHAT YOU NEED TO KNOW

1 What is meningococcal disease? Meningococcal disease is a serious illness, caused by a bacterium. It is a leading cause of bacterial meningitis in children 2-18 years old in the United States. Meningitis is an infection of fluid surrounding the brain and the spinal cord. Meningococcal disease also causes blood infections.

About 2,600 people get meningococcal disease each year in the U.S. 10-15% of those people die, in spite of treatment with antibiotics. Of those who live, another 11-19% lose their arms or legs, become deaf, have problems with their nervous systems, become mentally retarded, or suffer seizures or strokes.

Anyone can get meningococcal disease. But it is most common in infants less than one year of age and people with certain medical conditions, such as lack of a spleen. College freshmen who live in dormitories have an increased risk of getting meningococcal disease.

Meningococcal infections can be treated with drugs such as penicillin. Still, about 1 out of every ten people who get the disease dies from it, and many others are affected for life. This is why preventing the disease through use of meningococcal vaccine is important for people at highest risk.

2 Meningococcal vaccine Two meningococcal vaccines are available in the U.S.:

- Meningococcal polysaccharide vaccine (MPSV4) has been available since the 1970s.
- Meningococcal conjugate vaccine (MCV4) was licensed in 2005.

Both vaccines can prevent 4 types of meningococcal disease, including 2 of the types most common in the United States and a type that causes epidemics in Africa. Meningococcal vaccines cannot prevent all types of the disease. But they do protect many people who might become sick if they didn't get the vaccine.

Both vaccines work well, and protect about 90% of those who get it. MCV4 is expected to give better, longer-lasting protection.

MCV4 should also be better at preventing the disease from spreading from person to person.

3 Who should get meningococcal vaccine and when? MCV4 is recommended for all children at their routine preschoolers visit (11-12 years of age). For those who have never gotten MCV4 previously, a dose is recommended at high school entry.

Other adolescents who want to decrease their risk of meningococcal disease can also get the vaccine. Meningococcal vaccine is also recommended for other people at increased risk for meningococcal disease:

- College freshmen living in dormitories.
- Microbiologists who are routinely exposed to meningococcal bacteria.
- U.S. military recruits.
- Anyone traveling to, or living in, a part of the world where meningococcal disease is common, such as parts of Africa.
- Anyone who has a damaged spleen, or whose spleen has been removed.
- Anyone who has terminal complement component deficiency (an immune system disorder).
- People who might have been exposed to meningitis during an outbreak.

MCV4 is the preferred vaccine for people 11-55 years of age in these risk groups, but MPSV4 can be used if MCV4 is not available. MPSV4 should be used for children 2-10 years old, and adults over 55, who are at risk.

How Many Doses? People 2 years of age and older should get 1 dose. (Sometimes an additional dose is recommended for people who remain at high risk. Ask your provider.) MPSV4 may be recommended for children 3 months to 2 years of age under special circumstances. These children should get 2 doses, 3 months apart.

4 Some people should not get meningococcal vaccine or should wait

- Anyone who has ever had a severe (life-threatening) allergic reaction to a previous dose of either meningococcal vaccine should not get another dose.
- Anyone who has a severe (life-threatening) allergy to any vaccine component should not get the vaccine. Tell your doctor if you have any severe allergies.
- Anyone who is moderately or severely ill at the time the shot is scheduled should probably wait until they recover. Ask your doctor or nurse. People with a mild illness can usually get the vaccine.
- Anyone who has ever had Guillain-Barre Syndrome should talk with their doctor before getting MCV4.
- Meningococcal vaccines may be given to pregnant women. However, MCV4 is a new vaccine and has not been studied in pregnant women as much as MPSV4 has. It should be used only if clearly needed.
- Meningococcal vaccines may be given at the same time as other vaccines.

5 What are the risks from meningococcal vaccines? A vaccine, like any medicine, could possibly cause serious problems, such as severe allergic reactions. The risk of meningococcal vaccine causing serious harm, or death, is extremely small.

Mild problems Up to about half of people who get meningococcal vaccine have mild side effects, such as redness or pain where the shot was given.

If these problems occur, they usually last for 1 or 2 days. They are more common after MCV4 than after MPSV4.

A small percentage of people who receive the vaccine develop a fever.

Severe problems

- Serious allergic reactions, within a few minutes to a few hours of the shot, are very rare.
- A few cases of Guillain-Barre Syndrome, a serious nervous system disorder, have been reported among people who get MCV4. There is not enough evidence yet to tell whether they were caused by the vaccine. This is being investigated by health officials.

6 What if there is a moderate or severe reaction?

What should I look for?

- Any unusual condition, such as a high fever or behavior changes. Signs of a serious allergic reaction can include difficulty breathing, hoarseness or wheezing, hives, paleness, weakness, a fast heart beat or dizziness.

What should I do?

- Call a doctor, or get the person to a doctor right away.
- Tell your doctor what happened, the date and time it happened, and when the vaccination was given.
- Ask your doctor, nurse, or health department to report the reaction by filing a Vaccine Adverse Event Reporting System (VAERS) form.

Or you can file this report through the VAERS web site at www.vaers.org, or by calling 1-800-822-7967. VAERS does not provide medical advice.

7 How can I learn more?

- Ask your doctor or nurse. They can give you the vaccine package insert or suggest other sources of information.
- Call your local or state health department.
- Contact the Centers for Disease Control and Prevention (CDC).
- Call 1-800-232-4636 (1-800-CDC-INFO)
- Visit CDC's National Immunization Program website at www.cdc.gov/nip
- Visit CDC's meningococcal disease website at www.cdc.gov/nid/dh/dp/meningococcal_g.htm
- Visit CDC's Traveler's Health website at www.cdc.gov/travel

Figure 2: Immunization Requirement Form, four pages (first page, upper left corner).

The remainder of the initial page of the four-page document lists recommended immunizations. Page two (Immunization Instructions) provides details that relate to the first page. Pages three and four consist of a Centers for Disease Control (CDC) and Prevention National Immunization Program Information Statement entitled “Meningococcal Vaccines: What You Need To Know.” Supplementary to this document is a photocopy of the immunization record. In the place of a photocopy of this record, a signature from a Licensed Health Care Provider can be provided to certify measles immunity.

2.2. STUDENT HEALTH INSURANCE INFORMATION FORM

Though ISU does not require health insurance, they do require a record stating whether the student is currently covered. Coverage is offered separately through a university insurance plan that a student may choose to join. The Thielen Student Health Center does perform basic health services free of charge to students. These services are built into a Health Fee charged to all students each semester. This one-page document (Figure 3.) primarily asks whether a student is currently covered or not. If the student is covered, information regarding the policyholder and the insurance company are required. Supplementary to this document is a photocopy of the insurance card. Currently, this form can be filled out in its .pdf form.

IOWA STATE UNIVERSITY THOMAS B. THIELEN STUDENT HEALTH CENTER
Student Health Insurance Information

Student's Full Name: _____
 Social Security #: _____ Date of Birth: _____ Age: _____
 Eligibility Status: Undergraduate Graduate Assistant Post Doctorate Spouse Dependent
 Student Status: Full Time Part Time - number of credits: _____

I am **NOT** covered by any insurance policies.
(STOP and Sign statement - do not complete rest of form) Student's Signature & Date _____

I have the following types of insurance: (check all that apply)
 Medical Insurance; Pharmacy Insurance
If the student is covered under more than one plan, please list the primary insurance in the space provided below. Provide any secondary insurance information - such as, the Policyholder information for this secondary plan on the back of this form.

Please attach a copy of all active insurance cards (front & back)

Medical Insurance Information (* = Required Information)
 *Primary Policyholder's Full Name: _____
 *Relationship to Patient: _____
 *Phone Number: _____ *Date of Birth: _____
 *Address: _____
 *City: _____ *State: _____ *Zip: _____

Complete only if information is not located on copy of insurance card.
 Insurance Company: _____ Phone Number: _____
 Address: _____ State: _____ Zip: _____
 City: _____
 Policy #: _____ Group #: _____

Complete only if this is a new policy
 Does this policy replace last year's policy? Yes No If yes, end date: _____
 Name of previous insurance company: _____

On my behalf or for my underage child: I authorize the release of any medical information necessary to process claims submitted to the insurance companies I have provided to the Thielen Student Health Center. I also authorize payment of benefits to the clinic/physician or supplier of services rendered indicated on the billing document.

Student's Signature _____ Date _____
 Parent/Guardian Signature (if patient is under 18 years of age) _____ Date _____

For Office Use Only
 SID # _____ Chart made yes no Year _____ Entered by _____

ISU TSHC 403, Rev 5/04; 2/05 Insurance Information

Figure 3: Student Health Insurance Form, one page.

2.3. HEALTH HISTORY FORM

Though students may request a file transfer from their family physician, they do not need to do so. In its place, or in addition, this four-page form (Figure 4.) asks the student their entire health history (allergies, medications, surgeries, medical problems or illnesses), and those of their immediate family, as well as collecting emergency information.

IOWA STATE UNIVERSITY
Thielen Student Health Center
Health History Form

Please complete all pages of this form and bring to your SU Orientation or return by mail or fax to:
2260 Thielen Student Health Center, Iowa State University, Ames, Iowa 50011-2260
Phone: 515-294-5881, FAX: 515-294-5892

This information will be kept confidential according to the Thielen Student Health Center privacy policy which is available on our web site at <http://www.public.iastate.edu/~health/homepage.html>

A. PERSONAL DATA

Name: _____ Sex: Female Male
Last (family) First Middle

Student ID Number: _____ Date of Birth: _____

Country of Citizenship: _____

Entrance date to Iowa State University: Fall Spring Summer _____ Year

Current Physician: _____
Physician's name Address of Physician's office (include city, state, zip)

Physician's phone number: _____ Physician's fax number: _____

B. EMERGENCY DATA

In an emergency, call _____ Parent Guardian Spouse
Name of Person

Home Address: _____

Home Phone #: _____ Cell Phone #: _____

Work Address: _____

Work Phone #: _____

Health History form, revised 12/06

IOWA STATE UNIVERSITY
Thielen Student Health Center
Student Health Information

NAME: _____ Student ID: _____ DATE: _____

ALLERGIES: (include medications, latex, food, bee stings, pollen, animals, etc) **Reaction:**

MEDICATIONS: (include non-prescription, birth control pills, herbal, vitamins, medications you only take once in a while such as allergy or asthma meds and allergy shots)
Medication Name: _____ **Dosage if known:** _____ **How often:** _____

SURGERIES, PROCEDURES, INJURIES, FOREIGN TRAVEL, & HOSPITALIZATIONS:
Event: _____ **Reason:** _____ **Date:** _____

MEDICAL PROBLEMS OR ILLNESSES: (for student only)

Type of Problem:	Disease:	Treatment or Surgery:	Date:
Heart (arrhythmias, high blood pressure, palpitations, rhythm problems, other)	_____	_____	_____
Skin (acne, warts, abnormal moles, rashes, psoriasis, other)	_____	_____	_____
Stomach (ulcers, reflux, gastritis, liver or gallbladder disease, other)	_____	_____	_____
Bones (fracture, bowed, osteoporosis, osteoarthritis, inflammatory bowel disease, chronic constipation, Crohn's disease, other)	_____	_____	_____
Uterus (uterine disease, infection, or fibroids, recurrent bladder infection or UTI, other)	_____	_____	_____
Head, Face, Ear, Nose, Throat (problems seeing or hearing, chronic infections, dental problems, other)	_____	_____	_____

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IOWA STATE UNIVERSITY
Thielen Student Health Center
Student Health Information

NAME: _____ Student ID: _____ DATE: _____

Type of Problem:	Disease:	Treatment or Surgery:	Date:
Blood (anemia, bleeding or clotting disorders, blood clot in legs, stroke, sickle cell, leukemias, lymphomas, other)	_____	_____	_____
Immune System (allergies, hay fever, lupus, HIV or AIDS, other)	_____	_____	_____
Infectious Disease (measles, chicken pox, TB, malaria, hepatitis, sexually transmitted disease—chlamydia, herpes, HPV, other)	_____	_____	_____
Endocrine (diabetes, thyroid, elevated cholesterol or triglycerides, obesity)	_____	_____	_____
Muscle or Bone Disease or Fracture (broken bone, joint injuries, include right or left, scoliosis, fibromyalgia, other)	_____	_____	_____
Cancer (include type)	_____	_____	_____
Neurological (migraine, convulsions, seizures, fainting spells, other)	_____	_____	_____
Mental Health (depression, anxiety, ADHD, ADHD eating disorder, anorexia, bulimia, alcohol or drug abuse, other)	_____	_____	_____
Respiratory (asthma, sports or exercise asthma, lung disease, onset of substance/abuse, sleep apnea, other)	_____	_____	_____
Obstetric/gynecologic (abnormal Pap smear, sexually transmitted disease, polycystic ovaries, other)	_____	_____	_____
Stress (family, relationship or financial problems, other)	_____	_____	_____
OTHER (ANY problems, illness, or hospitalizations not listed above)	_____	_____	_____

Signature: _____

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IOWA STATE UNIVERSITY
Thielen Student Health Center
Family Health History

NAME: _____ Student ID: _____ DATE: _____

Please check the box and write year illness began, if known	Mother	Father	Brother	Sister	Maternal Grand-mother	Maternal Grand-father	Paternal Grand-mother	Paternal Grand-father
Abnormal bleeding tendency or hemophilia								
Alcohol/Drug abuse problem								
Anemia								
Arthritis								
Asthma								
Blood disease								
Cancer (what type)								
Colon or bowel disease								
Convulsions or seizures								
Depression								
Diabetes								
Eating disorder								
Gallbladder disease								
Liver disease								
Hay fever								
Headaches, severe/migraine								
Hearing problem								
Heart disease (myocardial infarction, etc.)								
High blood pressure								
High cholesterol								
HIV infection/AIDS								
Kidney disease								
Malaria								
Mental illness								
Obesity								
Orthopedic problems (knee, etc.)								
Poor circulation or history of blood clots								
Sickle cell disease								
Thyroid problems								
Tuberculosis								
Ulcers								

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Figure 4: Health History Form, four pages (first page, upper left corner).

2.4. OTHER FORMS

In addition to the aforementioned three basic forms required of new students, when a student first receives any time of care at TSHC, they are required to fill out an Acknowledgement for Receipt of Notice of Privacy Practices. For this form, there are three different versions of the same form with only the header being different for: Thielen Student Health Center, Cyclone Sport Medicine / Physical Therapy, and ISU Athletic Training Department.

2.5. BROCHURES AND WEB SITE

Though not as essential to this study as the initial checklist forms, the brochures and web site from TSHC that a new student may encounter are integral to the initial impression of the health center, its health priorities and qualifications. Of the brochures, there are two initial brochures new students are likely to encounter; one covers the overall capabilities of TSHC and the other billing of health fees and services.

There are approximately 75 brochures commonly in circulation at the health center. Of these, 18 with information regarding drugs/alcohol/tobacco use, 16 deal with sex related issues, and 8 with dietary health. The vast majority of these are not produced by Thielen, but are obtained by TSHC from sources such as the American College Health Association (ACHA) that provided 22, ETR Associates providing 20, and the American Cancer Society provided 7. Which brochures are carried is determined by the TSHC Marketing and Education Committee, which consist of doctors, nurses, pharmacists, the communications director as well as grad assistants from communications.

Brochures are primarily distributed through racks located throughout TSHC (Figure 5.), though as mentioned earlier, a few are distributed at campus events such as new student orientations. Another important method of delivery is from nurses, pharmacists and physicians. There are many brochure racks are located near examination rooms, though there are smaller brochure stands next to the reception desk, the pharmacy and in a Wellness Center.



Figure 5: A brochure rack located in the main waiting room of Thielen Student Health Center.

However, in 2002, approximately 82% of 18-29 year olds (the vast majority of college students) find most of their health information online (Wurman). In line with this fact, the TSHC current plan is to minimize the number of brochures available in print, and distribute greater information through the web site, which is in the earlier stages of being redesigned. As the only initial distribution point for the Checklist Forms, the web site plays an important role in distributing not only these essential forms, but also may act as an introduction to TSHC and health information available on the site.

3. ANALYSIS

In analyzing the materials introduced to new students, it is important to understand the presentation and context of the information intended to be distributed. This initial study examines three components: the design (typography, page layout, etc.) that may impact the reading of information, the conceptual content of the information (consistency), followed by the structure of the information. This type of examination is described by Caroline Jarrett, a usability consultant, as a three-layer form model for examining the design of forms that describes as: Look (formal aspects of the design), Content (shaping the material so that is comprehensible to the audience), and Task Structure (including only information needed to accomplish the tasks required), (Lipton)

3.1. LOOK

The design of the page layout and the use of typography may be often overlooked in the design of documents and forms. In using documents and following instructions, many users may blame themselves when they experience problems with the instructions, and not necessarily place proper blame on the design of the instructions itself (Schrivier). Throughout the design of these documents, there are many glaring inconsistencies of style and page layout, which may seem indicate that these forms were designed at very different times and by different people over a period of years. Some indicate revision dates in 2003, 2004, 2005, and 2006, which presumably included only updating the content, and not the unifying look of the design.

Throughout the documents, there is an inconsistent use of blank space (often referred to as white or negative space) to aid in providing horizontal and vertical spatial cues. Spatial cues are crucial in organizing the perception of space (Schrivier). There is also very little space for writing on the Health History Form (Figure 4.) on pages two and three.

At the top of all three forms and the checklist itself, all clearly state the institution name, however, the form of the name is inconsistent. In one case the format follows the logotype style as seen on letterheads, but it does not appear in this configuration on the other forms.

All the documents show a lack of a grid or at least inconsistent usage of a grid. Figure 2 and 4 show dominant large blocks of information as defined by the use of rules (or outlines), yet within these structures, there is an inconsistent internal structure. For example, underneath the heading "Recommended Immunizations," (Figure 2.), the first four vaccinations read from left to right and are separated into two columns, but at the fifth (Varicella/Chickenpox), this line moves across both columns, yet aligns with the columns above it on the right side.

Serifed typefaces such as Times Roman are typically viewed as easier to read in forms, this may be due to familiarity more than anything else (Schrivier). Though the typeface is typically serifed on these forms, sans-serifed is the only face that appears on the Student Health Insurance Information form. This may not mean that the form is necessarily harder to read, but at the very least, this creates an inconsistent overall look to the forms as a whole. The type sizes themselves vary widely, and are different on each document, some of the smaller type may possibly be hard to read, and may not fax very well.

The Checklist for Requirements (Figure 1.) appears on speckled purple/lavender paper. The Department of Health and Human Services meningitis information (pages 3-4 of the Immunization Requirement form) appears to be a scan of the original source document based on the bitmapped appearance of the type.

3.2. CONTENT

Much of the information and terms in these forms may be unfamiliar to new students; particularly those for whom English may not be their first language, consistent usage of these terms would be essential. How some of this required information is referred to on the forms changes frequently. Thielen Student Health Center is referred to in five ways throughout these particular forms: Iowa State University Thielen Student Health Center, Thomas B. Thielen Student Health Center, TSHC, ISU TSHC, and Thielen Student Health Center. Interestingly, the most important information required on the Immunization Requirement Form (Figure 2.) such as terms like “measles” changes to “measles (rubeola)”, which could be confused with “rubella,” and the term “rubeola” is used alone on page 2. Inexplicably the acronym MMR, the most common type of immunization for measles is never mentioned, though “Measles, Mumps, Rubella” (MMR) is mentioned. In addition, measles occasionally begins with an initial cap.

On the first page of the Immunization Requirement form (Figure 2.), and under the heading “Required Immunizations of all new students (including transfer and graduate):” there are three subheadings: Measles (Rubeola) Immunity, Meningitis, and Tuberculosis (TB) Testing. Of these “required” immunizations, only the first (measles) is actually required of all new students. The meningitis heading only refers to receiving information about the bacteria and if a student is or is not immunized. The TB testing is only required for non-U.S. citizens. Following the “Required” heading is “Recommended Immunizations,” listing eight vaccinations, but does not include meningitis at all, though page 3 of this same document from the Department of Health and Human Services seems to indicate that a new student should get this vaccination.

Another smaller, but confusing inconsistency, is that on each form the new student identity number (itself variously referred to as ISU University Identification Number, Student ID Number, or SID) is required to be written in near the top, however, on the Student Health Insurance Information form, the student’s social security number is asked for instead.

3.3. TASK STRUCTURE

Janice Redish, an information design consultant, is quoted in *The Practical Guide to Information Design* as saying that in the design of any form (or for any information design project), one should ask themselves the following: 1. What are we trying to do here? 2. Who's the audience and what should we keep in mind about them? 3. What's the scenario? What do I expect the audience to do? (Lipton).

The task structure as described by the Checklist for Requirements as distributed by TSHC (Figure 6.) seems to have a very simple and straightforward flow. Upon receipt of the checklist, the student and/or their family downloads the three necessary forms, fills them out, photocopies an insurance card, and copies the immunization record or obtains the signature of a licensed Health Care Provider. Together, these are then mailed, faxed or hand-delivered to TSHC who then creates a new medical record, which may then be digitized.

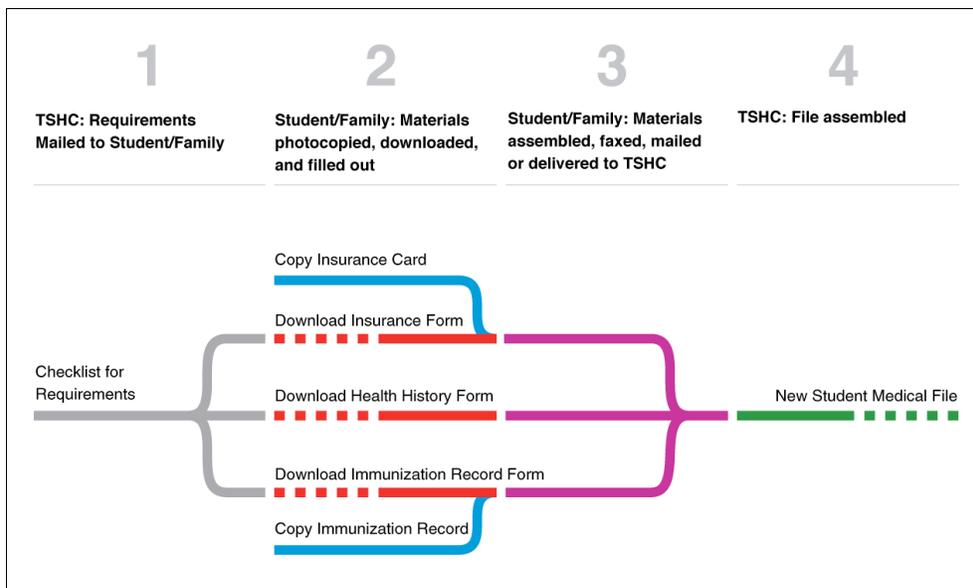


Figure 6: Overall task structure.

However, a closer look shows that there appears to be five major points for potential problems (Figure 7.) in this structure.

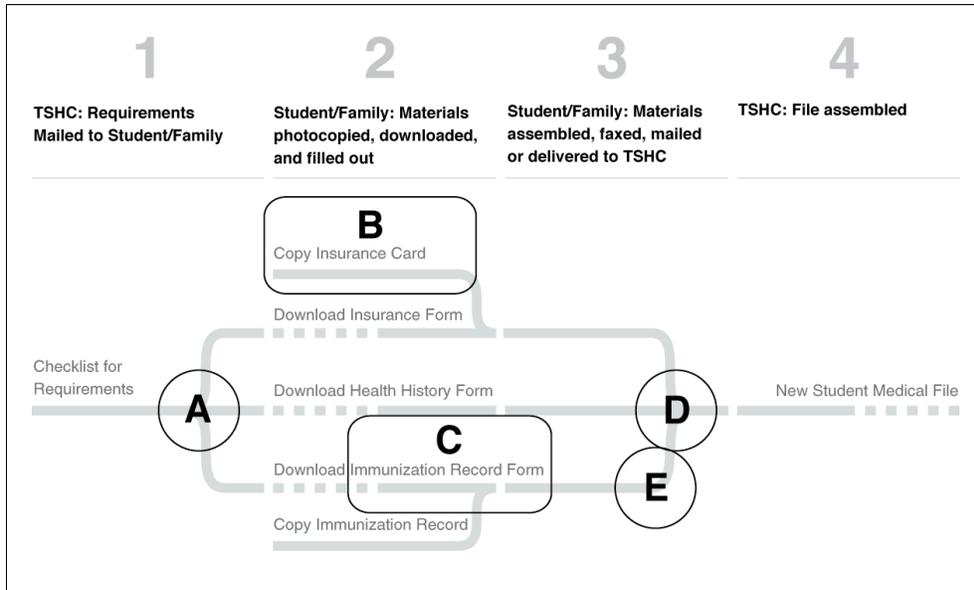


Figure 7: Potential points of confusion in the task structure.

- A. Though downloading forms saves on paper and mailing costs, it assumes all students will have easy access to a computer and printer.
- B. If a student requires insurance through the university, that enrollment would need to be taken care of prior to filling out this information.
- C. Confusing and out of order task structure on Immunization Record Form.
- D. Though faxing is described as one way to send completed forms, based upon observation of conversations with parents and presentations during new student orientations, faxing problems are significant. Doctor signatures get cut off on occasion and, especially during busy registration periods, the fax machine runs out of paper or gets jammed, as a result, faxing may not be recommended. In a recent survey one comment was "Several referrals and records of mine were 'lost' when faxed to the health center. This makes me not trust them with my records and information." (Design Information Research Group, student survey, summer 2007). Currently, about 19% of forms are submitted by fax.
- E. Approximately $\frac{1}{4}$ of new student Immunization Record Forms are incomplete or not filled out by students each year (R. Rodriguez, personal communication, June 11, 2007).

As mentioned earlier, currently about 1,000 (or $\frac{1}{4}$) of the new student Immunization Requirement forms are either filled out incorrectly, or not at all. In order for a freshman student to register for their second semester, this form needs to be properly filled out prior to September 31st (roughly 6 weeks into their first semester) or they will be unable to register for the spring semester of that first year. The return of these forms and the resulting correspondence is an additional paperwork burden for TSHC, and for families and their students, who could potentially miss out on registering for required courses the next semester.

If one follows the structure of the requested reading of information pertaining to various immunizations from the first page, many issues begin to appear in this form (Figure 8.). Though measles is the only required immunization, the fact that further information about measles is on the second page is never mentioned. The required information about meningitis (meningococcal disease) appears on pages 3 and 4, a separate publication from the Department of Health and Human Services. Based upon a sample of 89 filled out Immunization Requirement forms viewed for this paper, 57% did not check the box for “I have been provided information on Meningitis,” even though this is the second most important part of the form. Furthermore, only 34% of the forms checked the box for this box and one of the other boxes indicating whether they are or are not immunized. The required (for non-U.S. citizens) tuberculosis skin test information appears in the middle of the third paragraph on the second page, and is only mentioned as being there under “Recommended Immunizations” on the first page, though it is required for this group of students.

The figure displays two documents with red annotations indicating a task path and information blocks. The top document is the 'Iowa State University Immunization Requirement' form. Red boxes highlight the 'MEASLES REQUIREMENT' section, the 'RECOMMENDED IMMUNIZATION' section, and the 'TUBERCULOSIS (Tb) Testing' section. Red lines connect these sections to a 'Meningococcal Vaccines' informational page below. The 'Meningococcal Vaccines' page has red boxes highlighting sections 1, 3, 4, 5, and 6, which contain detailed information about the disease, vaccination status, and risks. The 'Meningococcal Vaccines' page is titled 'WHAT YOU NEED TO KNOW' and includes sections for 'What is meningococcal disease?', 'When should you get meningococcal vaccine and when?', 'What are the risks from meningococcal vaccines?', and 'What if there is a moderate or severe reaction?'. The 'Iowa State University Immunization Requirement' form also includes sections for 'MEASLES REQUIREMENT', 'RECOMMENDED IMMUNIZATION', and 'TUBERCULOSIS (Tb) Testing'. The form includes fields for personal information, immunization status, and a section for 'RECOMMENDED IMMUNIZATION' with checkboxes for various vaccines. The 'Meningococcal Vaccines' page provides detailed information about the disease, including symptoms, risk factors, and vaccination recommendations. The red annotations highlight the specific information blocks and the task path across both documents.

Figure 8: Task path and information blocks across Immunization Record Form.

The recommended immunizations at the bottom of the first page lead to further information on the back, but they are no longer in the same order. In addition, though mumps and rubella appear as recommended immunizations on the first page, there is no information about them on the second page at all. Likewise, on the second page, information is included about pneumococcal pneumonia and influenza, yet these do not appear on the first page of the document.

4. CONCLUSIONS

Though this initial research focuses on health care forms in an on-campus healthcare situation, this research is applicable to many areas where this type of form is used, particularly in other healthcare situations where many of the processes are the same. In this particular context, one in which students are just beginning to enter the world of more adult concerns, such as health insurance, health histories and immunizations, their time in a university, when they are learning the foundations of the fields in which they intend to work, may be one of the most important times to begin to educate young adults about the health care process as well. It is important for them to learn to trust those in health care, and have them begin to take an active role in their own health.

There are evidently areas for improvement in the look, content and task structure based upon this qualitative analysis. One of the next steps would be to talk with THSC Quality Assurance and find out more about existing issues. Following this, obtaining more data on actual user experiences to build a robust understanding of narratives from both the student and clinic perspectives. This would help in providing information on directions for a future redesign, which seems to be imminent as these processes are moved online. The present task of having new students fill out the forms after downloading them will be phased out after this current enrollment cycle. The new process will be to have students fill them out securely online. Despite the obvious advantages of having all this data collected digitally, there will continue to be cases that do not follow this mode and parts of the process will still require photocopying. Nevertheless, this research can make possible a more effective redesign and not just a repurposing of the existing look, content, and task structure, but a re-envisioning of it as well, for both online and print forms.

As a beginning point, it would seem necessary to examine exactly why so many of the Immunization Requirement forms are returned. Is it the confusing look, content, and task structure, or a combination? Would simplified language help? For all the documents, a template and a style guide would be useful in creating a unified look in conjunction with a sound design in regards to page layout (blank space), typography and grid. As these forms are redesigned for online completion, there is the possibility of color use to help different sections and help establish a clearer hierarchy. Guidelines for writing could do the same, and help make plain some of the more technical medical terms that are found in the documents. Another positive aspect of the redesign could be the elimination of redundant questions for text fields such as name, country of citizenship, birth date and student identity number as these fields could be auto-filled online.

Bureaucratic processes may be necessary to health care, however they need not be confusing. Much confusion can be reduced simply through a unified look, but more importantly, to keep in mind how a user may use a document, and give them the information they need in a clear manner. If these processes seem obscure, or redundant, a user may merely relinquish control by not participating in the process, since the whole process may seem too large and too complex, when it really may not be.

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