12190 HOUSE JUDICIARY

- congested, bloody nose
- acne and mild skin disorders
- skin discoloration (chloasma, face and abdomen)
- mild to severe backache and strain
- increased headaches
- difficulty sleeping, and discomfort while sleeping
- increased urination and incontinence
- bleeding gums
- pica
- breast pain and discharge
- swelling of joints, leg cramps, joint pain
- difficulty sitting, standing in later pregnancy
- inability to take regular medications
- shortness of breath
- higher blood pressure
- hair loss
- tendency to anemia
- curtailment of ability to participate in some sports and activities
- infection including from serious and potentially fatal disease (pregnant women are immune suppressed compared with non-pregnant women, and are more susceptible to fungal and certain other diseases)
- extreme pain on delivery
- hormonal mood changes, including normal post-partum depression
- continued post-partum exhaustion and recovery period (exacerbated if a c-section -- major surgery -- is required, sometimes taking up to a full year to fully recover)

Normal, expectable, or frequent PERMANENT side effects of pregnancy:

- stretch marks (worse in younger women)
- loose skin
- permanent weight gain or redistribution
- abdominal and vaginal muscle weakness
- pelvic floor disorder (occurring in as many as 35% of middle-aged former child-bearers and 50% of elderly former child-bearers, associated with urinary and rectal incontinence, discomfort and reduced quality of life)
- changes to breasts
- varicose veins
- scarring from episiotomy or c-section
- other permanent aesthetic changes to the body (all of these are downplayed by women, because the culture values youth and beauty)
- increased proclivity for hemorrhoids
- loss of dental and bone calcium (cavities and osteoporosis)

Occasional complications and side effects:

- hyperemesis gravidarum
- temporary and permanent injury to back
- severe scarring requiring later surgery (especially after additional pregnancies)
- dropped (prolapsed) uterus (especially after additional pregnancies, and other pelvic floor weaknesses -- 11% of women, including cystocele, rectocele, and enterocele)
- pre-eclampsia (edema and hypertension, the most common complication of pregnancy, associated with eclampsia, and affecting 7 - 10% of pregnancies)

- eclampsia (convulsions, coma during pregnancy or labor, high risk of death)
- gestational diabetes
- placenta previa
- anemia (which can be life-threatening)
- thrombocytopenic purpura
- severe cramping
- embolism (blood clots)
- medical disability requiring full bed rest (frequently ordered during part of many pregnancies varying from days to months for health of either mother or baby)
- diastasis recti, also torn abdominal muscles
- mitral valve stenosis (most common cardiac complication)
- serious infection and disease (e.g. increased risk of tuberculosis)
- hormonal imbalance
- ectopic pregnancy (risk of death)
- broken bones (ribcage, "tail bone")
- hemorrhage and
- numerous other complications of delivery
- refractory gastroesophageal reflux disease
- aggravation of pre-pregnancy diseases and conditions (e.g. epilepsy is present in .5% of pregnant women, and the pregnancy alters drug metabolism and treatment prospects all the while it increases the number and frequency of seizures)
- severe post-partum depression and psychosis
- research now indicates a possible link between ovarian cancer and female fertility treatments, including "egg harvesting" from infertile women and donors
- research also now indicates correlations between lower breast cancer survival rates and proximity in time to onset of cancer of last pregnancy
- research also indicates a correlation between having six or more pregnancies and a risk of coronary and cardiovascular disease

Less common (but serious) complications:

- peripartum cardiomyopathy
- cardiopulmonary arrest
- magnesium toxicity
- severe hypoxemia/acidosis
- massive embolism
- increased intracranial pressure, brainstem infarction
- molar pregnancy, gestational trophoblastic disease (like a pregnancy-induced cancer)
- malignant arrhythmia
- circulatory collapse
- placental abruption
- obstetric fist

More permanent side effects:

- future infertility
- permanent disability
- death

ALASKA PUBLIC HEALTH ASSOCIATION

Committed To Advancing Alaska's Public Health Since 1978

ALPHA

February 25, 2008

Representative_Jay_RAMRAS@legis.state.ak.us

Dear Representative Ramras:

The Alaska Public Health Association (ALPHA) represents 245 Alaskan public health professionals. The vision of the Alaska Public Health Association is that Alaskans shall have the knowledge and the means to live free of preventable illness and injury.

At the ALPHA annual meeting December 4, 2007 ALPHA passed Resolution 7-2007 Protecting and Enhancing Women's Ability to Obtain Safe, Legal Abortion Services.
http://www.alaskapublichealth.org/pdf/resolution 7-2007LateBreakerSafeLegalAbortion.pdf

ALPHA opposes HB 364 Notice and Consent for Minor's Abortion. ALPHA strongly opposes state laws that in any way limit access to safe, legal abortion services, including, but not limited to: a. mandatory delays and information/counseling that is not science-based, bans on specific abortion procedures, parental consent or notification requirements, targeted regulation of abortion providers, and limits for advanced practice clinicians in providing abortion services.

HB 364 is similar to the law mandating parental consent that was recently struck down by the Alaska Supreme Court in November 2007. Sending this issue through the legislature again uses up resources in a time-strapped legislative session. HB 364 raises serious issues about notification documentation and levies an unjustified burden on physicians who are described as the sole agents able to obtain consent and notification. Despite the intention to protect – mandatory notification and consent may result in a teen delaying speaking to anyone about a pregnancy and delay seeking medical services.

Cc: Representative_Nancy_DAHLSTROM@legis.state.ak.us
Representative_John_Coghill@legis.state.ak.us
Representative_Bob_LYNN@legis.state.ak.us
Representative_Ralph_SAMUELS@legis.state.ak.us
Representative_Max_GRUENBERG@legis.state.ak.us
Representative_Lindsey_HOLMES@legis.state.ak.us

P.O. Box 9-1825 Anchorage, AK 99509 907/332-1030 e-mail: publichealth@alaska.net www.alaskapublichealth.org

ALPHA Statement of Purpose: "The Alaska Public H[illegible]th Association shall promote the advancement of public health to improve health and quality of life for all Alaskans. To this end, ALPHA will exercise leadership with public health professionals and the general public in developing sound health policy, reducing health disparities and improving health outcomes for Alaskans."

From: Mako Haggerty [Mako@xyz.net]
Sent: Thursday, February 28, 2008 9:27 AM
To: Rep. Jay Ramras
Subject: Re HB 364

Dear Rep. Ramras

I oppose HB 364

I'm a lucky guy. I have good relationship with my kids. My friends are lucky, too. They also have good relationships with their kids. We talk. We keep those lines of communications open. But as we all know there are those who aren't so lucky. And it is those kids that this bill is aimed at, kids who are in trouble and have no one to turn to. This bill only abuses them further.
In fact I believe that a teenage girl that's in trouble may be one of the loneliest and weakest members of our society, and this bill beats them up.
If you want to outlaw abortion then do so across the board, but don't pick on the weakest of us. In fact I grew up believing that the government's responsibility was to protect the weaker members of our society.

HB 364 is a bully tactic. Shame on those who support it.

Mako Haggerty
Homer

Rep. Lindsey Holmes

From:	James Waldo
Sent:	Thursday, February 28, 2008 8:34 AM
To:	Rep. Lindsey Holmes
Subject:	FW: New Pom:HB 364 Notice & Consent For Minor's Abortion

---

From: Shay Wilson
Sent: Thursday, February 28, 2008 7:58 AM
To: James Waldo
Subject: New Pom:HB 364 Notice & Consent For Minor's Abortion

Cynthia Toohey
264? Forest Park Dr

Anchorage 99517-1326,

Gentlemen, I am amazed at how short your memories are. This issue was defeated in 2007 by the State Supreme court, shame on you!
Cynthia Toohey.

2/29/08

To: House Judiciary Committee

From: Jan Whitefield, MD, PhD

Madams and Sirs,

I felt it necessary to make comments on House Bill No. 364. I understand this is in committee now and discussion is underway. As a physician, and not a lawyer, I apologize if my comments seem naïve. The legal language does not read easily for non-legal individuals. Some observations follow.

Page 2, lines 13-19, the section for defense of or claim for violation:

> This states that I may use my clinical judgment regarding a concern for "immediate threat of serious risk to the life or physical health of the pregnant minor ..."
>
> > -Many providers would feel that psychological or psychiatric issues fall under the definition of "physical health" and might consider this in deciding on whether or not to do an abortion on a patient. If that occurs and a case is brought against the physician by a parent or the state, who decides whether the physician exercised appropriate judgment? Two equally qualified physicians may use their judgments and arrive at different conclusions.
> >
> > -If found guilty of failing to properly apply this statute, what are the penalties? Presumably this becomes a criminal act, not malpractice. Are there fines? Loss of License? Is there threat of imprisonment?

Page 3, lines 19-28 involving documentation of physical abuse.

Requires corroboration of the minor's testimony from one of five possible sources – a sibling over 21, a law enforcement officer, someone from DHSS, a grand parent of a stepparent. By very nature abuse is often silent, hidden, and the abused person is afraid to come forth about these issues. This is perhaps even more so for the less than 17 year old. Furthermore many will not have the presence of any of these in their lives. Is the teen who is abused and can't meet these requirements then not able to exercise this judicial by-pass?

Page 4, regarding notice to a parent:

For proper notification to a parent, one requirement is that a physician must place not less than five calls not less than 2 hours apart. If the first call is at 8:00 AM then I would call at 8,10,12,2,4 o'clock. This is a very onerous task to perform on a very busy day at the office, and not very realistic. The requirements placed on verification of telephone numbers and addresses to try to determine authenticity is even more onerous even though this may be delegated to other support persons. There is not a SINGLE OTHER MEDICAL PROCEEDUE that requires this much due diligence. It is easier would be take someone off of a ventilator for appropriate reasons than it would be to fulfill appropriate notification through phone calls and certified mailing.

Page 5, lines 15-18 – demonstration of maturation

"...complainant is sufficiently mature and well enough informed to decide intelligently whether to have an abortion without ..." How is this determination made? Is it by the court? How can the courts counsel the complainant about abortion when the court is not in the medical business, and may not know the risk themselves? Why is this judgment made by the court better than the judgment of the physician who understands the procedures with the risks and benefits? Will the courts hire what it may consider "appropriate" screeners to make this determination?

Page 5 through 6, judicial bypass.

Consider the teen who decides to exercise judicial bypass and comes completely prepared to file a complaint. The time from the initial filing through final decision of the Supreme Court, if that is required, can take as long as 11 working days. Considering that 11 working days can span NO LESS than two weekends, it would take 15 calendar days to complete the process. THEN the teen could schedule an abortion. This will inherently cause delays. These teens would therefore be getting procedures at later times in pregnancy, increasing risk, and pushing more into the second trimester. Our data shows that the teens are usually later in pregnancy when they face up to the situation and seek termination. This would compound these delays.

Womens Health 9075635027 p.2

As a physician I see this law as chilling. The risk of making an "error in judgment" carries an unknown penalty, and the standards to which I am held are ambiguous.

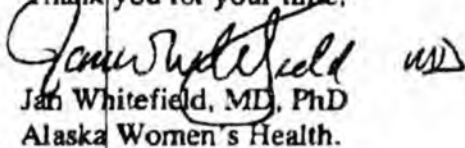
I think the burden of supplying corroboration by the teen are onerous, and would in many cases be impossible.

Notification is a time consuming process and chilling enough to prevent most providers from undertaking the process. Which of you will first verify a number then – PERSONALLY – get on the phone five times at specified intervals in a day call someone to attempt to accomplish something in your normal course of work? The notification process alone is sufficiently onerous to limit access for this group of individuals.

The by-pass process is onerous for a sophisticated adult, and more so for a mature, thinking, yet in-experienced teen. The risk of delays is excessive from a medical point of view, and will lead to increase risk of the procedure for any one who successfully navigates these hurdles.

As a practitioner I see this bill effectively preventing anyone under 17 from getting an abortion unless accompanied by a parent. Most teens who comes to use are accompanied by a parent. If they aren't, there is probably a very good reason they haven't involved a parent. For those accompanied by a parent this bill is irrelevant. For the ones without a parent, this bill will essentially exclude abortion as an option for them considering this above issue.

Thank you for your time,



Jan Whitefield, MD, PhD
Alaska Women's Health.

Rep. Lindsey Holmes

From: Joyce Bamberger [danjoyce@gci.net]
Sent: Thursday, February 28, 2008 4:13 PM
To: Rep. Jay Ramras
Cc: Rep. Nancy Dahlstrom; Rep. John Coghill; Rep. Bob Lynn; Rep. Ralph Samuels; Rep. Max Gruenberg; Rep. Lindsey Holmes
Subject: Parental consent/notice bill

As you requested, enclosed please find information regarding the legal status of the Alan Guttmacher Institute. As I mentioned to you in my hearing testimony, this Institute issued a public policy study on how harmful legislation such as this proposed bill is to woman's health based on scientific research and expert medical opinion. See, http://www.guttmacher.org/pubs/tgr/08/4/gr080406.html. Particularly persuasive are the position papers of the major medical organizations opposing this type of legislation.

Statements on Teen Access to Confidential Care

American Academy of Family Physicians: "Concerns about confidentiality may discourage adolescents from seeking necessary medical care and counseling, and may create barriers to open communication between patient and physician. Protection of confidentiality is needed to appropriately address issues such as... unintended pregnancy." (**Adolescent Health Care, 2001**)

American Academy of Pediatrics: "Health care professionals have an ethical obligation to provide the best possible care and counseling to respond to the needs of their adolescent patients...This obligation includes every reasonable effort to encourage the adolescent to involve parents, whose support can, in many circumstances, increase the potential for dealing with the adolescent's problems on a continuing basis....At the time providers establish an independent relationship with adolescents as patients, the provider should make.. clear to parents and adolescents [that]... confidentiality will be preserved between the adolescent patient and the provider." (**Confidentiality in Adolescent Health Care, 2004**)

American College of Obstetricians and Gynecologists: "The potential health risks to adolescents if they are unable to obtain reproductive health services are so compelling that legal barriers and deference to parental involvement should not stand in the way of needed health care for patients who request confidentiality. Therefore, laws and regulations that are unduly restrictive of adolescents' confidential access to reproductive health care should be revised." (**Access to Reproductive Health Care for Adolescents, 2003**)

American College of Physicians: "In the care of the adolescent patient, family support is important. However, this support must be balanced with confidentiality and respect for the adolescent's autonomy in health care decisions and in relationships with health care providers. Physicians should be knowledgeable about state laws governing the right of adolescent patients to confidentiality and the adolescent's legal right to consent to treatment." (**Ethics Manual: Fourth Edition, 1998**)

American Medical Association: "Our AMA...reaffirms that confidential care for adolescents is critical to improving their health....When in the opinion of the physician, parental involvement would not be beneficial, parental consent or notification should not be a barrier to care." (**Confidential Health Services for Adolescents, 2004**)

Society for Adolescent Medicine: "Confidentiality protection is an essential component of health care for adolescents because it is consistent with their development of maturity and autonomy and without it, some adolescents will forgo care....Health care professionals should support effective communication between adolescents and their parents or other caretakers. Participation of parents in the health care of their adolescents should usually be encouraged, but should not be mandated.... Laws that allow minors to give their own consent for all or some types of health care and that protect the confidentiality of adolescents' health care information are fundamentally necessary to allow health care professionals to provide appropriate health care to adolescents and should be maintained." (**Confidential Health Care for Adolescents: Position Paper of the Society for Adolescent Medicine, 2004**)

The Better Business Bureau website reports that the Guttmacher Institute is a non-profit 501(c)(3) corporation with no affiliation to Planned Parenthood. See, http://charityreports.bbb.org/public/Report.aspx?CharityID=2583.

Thank you for your consideration of these matters. Best wishes, Joyce Bamberger, 1036 West 22nd Street, Anchorage, Alaska 99503

Rep. Lindsey Holmes

From: Lynn Hartz [lhartz@alaska.com]

Sent: Thursday, February 28, 2008 2:48 PM

To: Rep. Lindsey Holmes

Subject: Testiimony HB 364

Dear Representative Holmes,
I am not in favor of HB 364. This bill is still in conflict with the state Supreme Court Ruling and will cost state money if passed in another unsuccessful trip through the courts. The health and well-being of children would be better and more surely served by fully funding Denali KidCare. Please do not pass HB 364 out of your committee.

Lynn Hartz MSN, ANP
3104 Brookside Drive
Anchorage, AK 99517
ph 907-248-4877
fax 907-222-1498

Rep. Lindsey Holmes

From: L J [jeanne9632541@yahoo.com]
Sent: Thursday, February 28, 2008 12:12 PM
To: Rep. Lindsey Holmes
Subject: *****SPAM***** HB 364

Dear Rep. Holmes,

I rarely write to legislators but I strongly object to HB 364.

I oppose House Bill 364 because...

Teenagers *are* talking to their parents.
In Alaska, teenagers are talking to their parents and including them in their pregnancy decisions. Only in very rare cases have teens not involved a parent. We are not talking about young teens seeking abortion services without the support of their parents. The state numbers do not back any of those theories.

Good family communication *can't* be mandated by government.
The best way to protect our teenagers is for parents to begin talking about responsible sexual behavior from the time they are young and foster an atmosphere of trust, respect, and compassion that assures teens they can come to them with problems or questions. The government should not be intruding into personal family situations.

Keeping teenagers safe *should be* the top priority.
Parents want their teenagers to be safe. It is more important for teens to be safe than the government passing laws to force them to talk to their parents. This bill will scare them away from seeking help, away from getting counseling, and toward other desperate measures, such as an illegal abortion. Parents know their teenagers may not always come to them when faced with an unintended pregnancy, but they want them to be safe. Despite the intention to protect – mandatory notification and consent will result in a teen delaying speaking to anyone about a pregnancy and delay seeking medical services. Teens in troubled families are truly at risk.

It is impractical to think that a teenager will take her case before a judge.
We need to be real about this issue and its implications. A pregnant teenager is not going to be marching into a courtroom to see a judge. She's alone. She's afraid. She doesn't know where to go or how to get the services that she needs. How likely is it that she'll walk into a courtroom and ask to see a judge? And what if she is from rural Alaska? Will she wait to see a local judge that knows her or her family? Will she try to get to Anchorage or Fairbanks?

HB 364 is unconstitutional.
A similar bill to HB 364 was found unconstitutional by the Alaska State Supreme Court in November 2007. We should not continue wasting the legislature's time on this issue.

I urge you to vote against this bill.

Sincerely,
Linda Luper
784 Chena Hills Drive
Fairbanks, AK 99709
907-457-7356

Be a better friend, newshound, and know-it-all with Yahoo! Mobile. Try it now.

Rep. Lindsey Holmes

From: Mako Haggerty [Mako@xyz.net]
Sent: Thursday, February 28, 2008 9:33 AM
To: Rep. Lindsey Holmes
Subject: Re: HB 364

Dear Rep Holmes

I oppose HB 364

I'm a lucky guy. I have good relationship with my kids. My friends are lucky, too. They also have good relationships with their kids. We talk. We keep those lines of communications open. But as we all know there are those who aren't so lucky. And it is those kids that this bill is aimed at, kids who are in trouble and have no one to turn to. This bill only abuses them further.
In fact I believe that a teenage girl that's in trouble may be one of the loneliest and weakest members of our society, and this bill beats them up.
If you want to outlaw abortion then do so across the board, but don't pick on the weakest of us. In fact I grew up believing that the government's responsibility was to protect the weaker members of our society.

HB 364 is a bully tactic. Shame on those who support it.

Mako Haggerty
Homer

Rep. Lindsey Holmes

From: Julie Barry [jabarry1@yahoo.com]
Sent: Wednesday, February 27, 2008 7:52 PM
To: Rep. Lindsey Holmes
Subject: Vote Against HB364!

Hello Representative Holmes,
I live in your district, 26, in Anchorage. I'd like to urge you to vote AGAINST HB364.

This bill attempts to legislate good family communication. While I wish that all teens lived in loving, supportive families, the fact is that not all do. Some teens have a reasonable fear of danger or homelessness if they were to approach their parents for permission to undertake a pregnancy termination.

I'm sure you're aware that data from other states that have implemented a parental notification and consent law have actually seen their abortion rate rise, or for those states who had been in a decline, the rate has declined more slowly. Parental notification and consent laws do not decrease instances of abortion, they increase them!

While doing so, they put the lives of young mothers and babies at risk as those young women delay getting medical attention.

This bill not only infringes upon the rights off teens to seek medical care, but it also wastes the valuable time of our legislators and our courts. A similar bill was found unconstitutional in November of 2007. Why wast everyone's time again?

Thank you,
Julie Barry

Looking for last minute shopping deals? Find them fast with Yahoo! Search.

Rep. Lindsey Holmes

From: Sharon [janibear@acsalaska.net]
Sent: Wednesday, February 27, 2008 1:02 PM
To: Rep. Lindsey Holmes
Subject: Re HB 364

This bill is a basic denial of the constitutional right of Choice.
While we think about parental consent being a positive model, and, surely, for the most part, we believe it is; there are so many circumstances that do not follow this "model" for underaged young women.

Think about the daughter(s) of "Papa" Pilgrim. How would the daughter ask her father for consent after he sexually molested her over and over?

With the population in Alaska, this is not an isolated incident. We have too few checks on the health and well-being of our children as it is. These kids are not emotionally able to talk to a judge, it's an impossible situation they find themselves in. And, legislation like this only makes it harder.

Must we continue to waste money on bills that are unconstitutional?
Please, do not pass HB 364.

Sharon and Richard Waisanen
44932 Eddy Hill Drive
Soldotna, AK 99669

262.6298

Rep. Lindsey Holmes

From: Valerie Anne Demming [vademming@acsalaska.net]
Sent: Wednesday, February 27, 2008 10:32 AM
To: Rep. Bob Lynn; Rep. Ralph Samuels; Rep. Max Gruenberg; Rep. Lindsey Holmes
Subject: HB 364

I oppose House Bill 364 because...

Teenagers are talking to their parents.
In Alaska, teenagers are talking to their parents and including them in their pregnancy decisions. Only in very rare cases have teens not involved a parent. We are not talking about young teens seeking abortion services without the support of their parents. The state numbers do not back any of those theories.

Good family communication can't be mandated by government.
The best way to protect our teenagers is for parents to begin talking about responsible sexual behavior from the time they are young and foster an atmosphere of trust, respect, and compassion that assures teens they can come to them with problems or questions. The government should not be intruding into personal family situations.

Keeping teenagers safe should be the top priority.
Parents want their teenagers to be safe. It is more important for teens to be safe than the government passing laws to force them to talk to their parents. This bill will scare them away from seeking help, away from getting counseling, and toward other desperate measures, such as an illegal abortion. Parents know their teenagers may not always come to them when faced with an unintended pregnancy, but they want them to be safe. Despite the intention to protect - mandatory notification and consent will result in a teen delaying speaking to anyone about a pregnancy and delay seeking medical services. Teens in troubled families are truly at risk.

It is impractical to think that a teenager will take her case before a judge.
We need to be real about this issue and its implications. A pregnant teenager is not going to be marching into a courtroom to see a judge. She's alone. She's afraid. She doesn't know where to go or how to get the services that she needs. How likely is it that she'll walk into a courtroom and ask to see a judge? And what if she is from rural Alaska? Will she wait to see a local judge that knows her or her family? Will she try to get to Anchorage or Fairbanks?

HB 364 is unconstitutional.
A similar bill to HB 364 was found unconstitutional by the Alaska State Supreme Court in November 20[illegible]. We should not continue wasting the legislature's time on this issue.

Valerie Anne Demming M. Ed. L.P.C.

Rep. Lindsey Holmes

From: Perry Reeve [perryreeve@mac.com]
Sent: Wednesday, February 27, 2008 8:00 AM
To: Rep. Lindsey Holmes
Subject: Oppose h.b.364

As a past child therapist I am opposed to house bill 364. Those from supportive homes would reach out for family help. This bill is meant mainly for the "at risk" population. It is unfortunate but children are occasionally exposed to relations who take advantage of them and they end up in "the family way." It is important that these victims are able to regain their life as undamaged as possible and not be subjected to further shame and possible ostracization by family members. You may be dealing with unsympathetic parents who say: "You made your bed, now sleep in it." Hopefully school counselors and health clinic providers are trained to be supportive and good advisers to those in need directing them to supportive options.

Perry Aiken Reeve

Rep. Lindsey Holmes

From: B. Gamble [manuoku@yahoo.com]

Sent: Tuesday, February 26, 2008 4:05 PM

To: Sen. Joe Thomas; Rep. David Guttenberg

Cc: Rep. John Coghill; Rep. Bob Lynn; Rep. Ralph Samuels; Rep. Max Gruenberg; Rep. Lindsey Holmes; Rep. Jay Ramras; Rep. Nancy Dahlstrom

Subject: *****SPAM***** I oppose House Bill 364

To my representatives and members of the Judiciary Committee: I write this e-mail because I will not be able to call in and testify.
These talking points (below) were not written by me, but I wholeheartedly agree. Please oppose HB 364!

I oppose House Bill 364 because:

HB 364 is unconstitutional.
A similar bill to HB 364 was found unconstitutional by the Alaska State Supreme Court in November 2007. We should not continue wasting the legislature's time on this issue.

Good family communication can't be mandated by government.
The best way to protect our teenagers is for parents to begin talking about responsible sexual behavior from the time they are young and foster an atmosphere of trust, respect, and compassion that assures teens they can come to them with problems or questions. The government should not be intruding into personal family situations.

Keeping teenagers safe should be the top priority.
Parents want their teenagers to be safe. It is more important for teens to be safe than the government passing laws to force them to talk to their parents. This bill will scare them away from seeking help, away from getting counseling, and toward other desperate measures, such as an illegal abortion. Parents know their teenagers may not always come to them when faced with an unintended pregnancy, but they want them to be safe. Despite the intention to protect – mandatory notification and consent will result in a teen delaying speaking to anyone about a pregnancy and delay seeking medical services. Teens in troubled families are truly at risk.

It is impractical to think that a teenager will take her case before a judge.
We need to be real about this issue and its implications. A pregnant teenager is not going to be marching into a courtroom to see a judge. She's alone. She's afraid. She doesn't know where to go or how to get the services that she needs. How likely is it that she'll walk into a courtroom and ask to see a judge? And what if she is from rural Alaska? Will she wait to see a local judge that knows her or her family? Will she try to get to Anchorage or Fairbanks?

Sincerely,
Jennifer Brook Gamble
324 Yana Court
Fairbanks, AK 99709
(907) 456-3775

Rep. Lindsey Holmes

From: Laura L Stats [lstats@bartletthospital.org]
Sent: Tuesday, February 26, 2008 9:57 AM
To: Rep. Lindsey Holmes; Rep. John Coghill; Rep. Ralph Samuels; Rep. Max Gruenberg
Subject: opposing house bill 364

Dear Members of the Alaska State House Judiciary Committee;

Thank you for your work in the Alaska State Legislature this year.

I would like to share my view on House Bill 364 as a emergency room nurse for over 25 years and a mother of 3 teens. I am in opposition of the bill because:

Teenagers are talking to their parents.
In Alaska, teenagers are talking to their parents and including them in their pregnancy decisions. Only in very rare cases have teens not involved a parent. We are not talking about young teens seeking abortion services without the support of their parents. The state numbers do not back any of those theories.

Good family communication can't be mandated by government.
The best way to protect our teenagers is for parents to begin talking about responsible sexual behavior from the time they are young and foster an atmosphere of trust, respect, and compassion that assures teens they can come to them with problems or questions. The government should not be intruding into personal family situations.

Keeping teenagers safe should be the top priority.
Parents want their teenagers to be safe. It is more important for teens to be safe than the government passing laws to force them to talk to their parents. This bill will scare them away from seeking help, away from getting counseling, and toward other desperate measures, such as an illegal abortion. Parents know their teenagers may not always come to them when faced with an unintended pregnancy, but they want them to be safe. Despite the intention to protect - mandatory notification and consent will result in a teen delaying speaking to anyone about a pregnancy and delay seeking medical services. Teens in troubled families are truly at risk.

It is impractical to think that a teenager will take her case before a judge.
We need to be real about this issue and its implications. A pregnant teenager is not going to be marching into a courtroom to see a judge. She's alone. She's afraid. She doesn't know where to go or how to get the services that she needs. How likely is it that she'll walk into a courtroom and ask to see a judge? And what if she is from rural Alaska? Will she wait to see a local judge that knows her or her family? Will she try to get to Anchorage or Fairbanks?

HB 364 is unconstitutional.
A similar bill to HB 364 was found unconstitutional by the Alaska State Supreme Court in

November 2007. We should not continue wasting the legislature's time on this issue.

Best regards,
Laura Stats R.N. CEN

Laura Stats, RN, CEN
Wellness Outreach Coordinator
Bartlett Regional Hospital
3260 Hospital Drive
Juneau, Alaska 99801
Phone 907.796.8918
Fax: 907.463.4919

Rep. Lindsey Holmes

From: Emeraldgal45@aol.com
Sent: Tuesday, February 26, 2008 9:01 AM
To: Rep. Lindsey Holmes
Subject: (no subject)

I oppose House Bill 364 because...

Teenagers *are* talking to their parents.
In Alaska, teenagers are talking to their parents and including them in their pregnancy decisions. Only in very rare cases have teens not involved a parent. We are not talking about young teens seeking abortion services without the support of their parents. The state numbers do not back any of those theories.

Good family communication *can't* be mandated by government.
The best way to protect our teenagers is for parents to begin talking about responsible sexual behavior from the time they are young and foster an atmosphere of trust, respect, and compassion that assures teens they can come to them with problems or questions. The government should not be intruding into personal family situations.

Keeping teenagers safe *should be* the top priority.
Parents want their teenagers to be safe. It is more important for teens to be safe than the government passing laws to force them to talk to their parents. This bill will scare them away from seeking help, away from getting counseling, and toward other desperate measures, such as an illegal abortion. Parents know their teenagers may not always come to them when faced with an unintended pregnancy, but they want them to be safe. Despite the intention to protect – mandatory notification and consent will result in a teen delaying speaking to anyone about a pregnancy and delay seeking medical services. Teens in troubled families are truly at risk.

Delicious ideas to please the pickiest eaters. Watch the video on AOL Living.

Rep. Lindsey Holmes

From: Sam Rose, D.C. [samrose@gci.net]
Sent: Monday, February 25, 2008 4:34 PM
To: Rep. Lindsey Holmes
Subject: Please oppose HB 364

Hi Lindsey,
I am asking you to oppose HB 364 which mandates parental consent and notification for abortion. I know this is a tough one politically but I think you know the reasons why this bill should be nixed. I assume Planned Parenthood has lobbied you on this bill and I know you were aware of this issue before you ran for office.
Thanks for all your hard work.

Sincerely,

Sam Rose.
3420 W. 30th Ave.
Anchorage, AK
99517
907-223-5324 (cell)
907-277-6361 (home)

Rep. Lindsey Holmes

From: Tracy Moore [tracyelmore@yahoo.com]

Sent: Monday, February 25, 2008 4:22 PM

To: Rep. John Coghill; Rep. Lindsey Holmes; Rep. Bob Lynn; Rep. Ralph Samuels; Rep. Max Gruenberg

Subject: *****SPAM***** HB 364

Stop wasting time on HB 364....I won't go into the myriad of reasons you should do this. I'll just throw this one out and just save some time...

I oppose House Bill 364 because HB 364 is unconstitutional!!!
A similar bill to HB 364 was found unconstitutional by the Alaska State Supreme Court in November 2007.

end of story...move on!!!

February 28th, 2008

Jacqueline Barsis
PO Box 1170
Sterling, AK 99672
(907) 262-0849

To Whom It May Concern:

I am writing to testify against HB 364. I am a mother of three teenagers, two boys and a girl. I find this bill unrealistic, intrusive and dangerous.

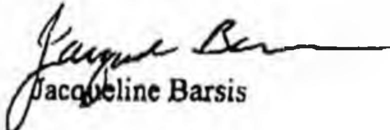
If any of my children felt they could not talk to me, I would want them to have someone else to talk to and help them through the difficult times. I would want them to find the resources they need. I would want them have access to safe and legal health care, which would not be available if this bill passes.

I've told my children they can tell me anything and I would help them work it out. However, it's not always easy to talk to your parents for fear of disappointment, so it is possible they would choose not to talk to me. In this case, they would not be able to find professional help or medical care in a timely manner because obtaining a court order is a time consuming process.

Mandating teens to go through the court system if they feel they can't talk to their parents is ridiculous. Teens have a hard enough time getting around, getting appointments and making arrangements. By the time the teen had a court order, their emotional and physical condition could be jeopardized. During the time it takes for a teen to get a court order if necessary, their health care needs have been ignored. The federal government doesn't like any barriers to health care, but in this bill, the courts become a barrier.

When it comes to women's choice, history has shown the woman, or girl in this case, always makes the choice that is right for her. If it is illegal for her to obtain an abortion, due to lack of parental consent, the teen will figure out a way to do it anyway. This bill is frustrating because if it's passed there will be some young women who will have illegal abortions and will die. This just doesn't seem like the right answer any way you look at it.

Thank you ,



Jacqueline Barsis

From: Lynn Hartz [lhartz@alaska.com]

Sent: Thursday, February 28, 2008 [illegible]:18 PM

To: Rep. Jay Ramras

Subject: Testimony HB 364

Dear Representative Ramras,
I am not in favor of HB 364. This bill is still in conflict with the state Supreme Court Ruling and will cost state money if passed in another unsuccessful trip through the courts. The health and well-being of children would be better served by fully funding Denali KidCare. Please do not pass HB 364 out of your committee.
Thank-you for your consideration of this request.

Lynn Hartz MSN, ANP

3104 Brookside Drive
Anchorage, AK 99517
ph 907-248-4877
fax 907-222-1498

Planned Parenthood
of Alaska

February 28, 2008

Chair Representative Jay Ramras for The Judiciary Committee Per Request of Vice Chair Representative Nancy Dahlstrom

I apologize in advance for the length of some of the documents. We have gone through and highlighted mention of parental consent and abortion. As you can see there is overwhelming agreement within the medical community that a physician should be making this decision with their client, the teen. All of the attached articles agree that parents should be involved when ever possible and parental involvement should be encouraged.

I appreciate your willingness to examine all aspects of this very complex bill. Planned Parenthood of Alaska strives to offer safe, affordable reproductive health care to men and women in Alaska, which in some cases involves abortion but more often is prevention. It is very important to me that parents are involved and participating in the lives of there children. Thank you again for the time you are dedicating to this issue.

Best Regards,

Clover Simon, MSW
CEO Planned Parenthood of Alaska

This is a summary - articles we could get online are attached.

Adolescents and Parental Notification for Abortion:

What California Can Learn from Health Care Professionals

At least 20 leading medical and health care professional organizations have issued policy statements regarding the importance of confidentiality in protecting the health of adolescents by ensuring their access to health care, including confidential care, and promoting the quality of that care. Health care professionals strongly support the important role of parents and other adults in safeguarding the health of adolescents. They also know that having an opportunity to offer confidential care enables health care professionals to learn to learn what they need to know about adolescents' health and behaviors and to provide careful assessment and counseling. Many medical organizations are opposed to mandatory parental consent or notification laws that would severely restrict teenagers' access to any health care that is essential to protect their health, including abortion and other reproductive health services.

Medical organizations support the important role of parents in adolescent health care

Health care professionals value the support and guidance that a parent can give to an adolescent patient. Many medical organizations have endorsed policy statements that health care providers should encourage their adolescent patients to inform and involve their parents in their health care decisions. Several medical organizations believe that health care providers should help to facilitate family communication as a way to enhance the confidence of both parents and teens as health care decision makers. Medical professionals also understand that some adolescents are not able to talk with their parents about health care decisions and that forcing teens to involve their parents would do more harm than good. Therefore, although voluntary involvement of parents by adolescents is strongly encouraged and desired by medical professionals, they also believe laws or policies mandating parental consent or notification are not in the best interests of adolescent patients.

- Adolescents should be encouraged to inform and involve their parents in their health care decisions and health care professionals should facilitate this communication.
- The importance of parental support should be balanced with confidentiality in health care decisions and health care professionals should facilitate this communication as appropriate.
- Providing confidential care does not preclude working toward the goal of family communication.
- Mandatory parental involvement, consent, and/or notification reduce the likelihood that some adolescents will seek health care.

In the organizations' own words:

"Health professionals have an obligation to provide the best possible care and counseling to respond to the needs of their adolescent patients." (AAP, AAFP, ACOG, and other organizations)

"The AMA encourages physicians to involve parents in the medical care of the adolescent patient, when it would be in the best interest of the patient. When, in the opinion of the physician, parental involvement would not be beneficial, parental consent or notification should not be a barrier to care." (AMA)

"Physicians should encourage [parents'] involvement in the [adolescent] patient's health and health care decisions and, when appropriate facilitate communication between the two." (ACOG)

"When minors request confidential services, physicians should encourage them to involve their parents. This includes making efforts to obtain the minor's reasons for not involving their parents and correcting misconceptions that may be motivating their objections." (AMA)

"Adolescents should be strongly encouraged to involve their parents and other trusted adults in decisions regarding pregnancy termination, and the majority of them voluntarily do so. (AAP)

"Finally, it is important to acknowledge that some adolescents do not have parents, parental support or any meaningful connection with parents. Some adolescents have experienced abuse or neglect by parents, and have legitimate fears about future abuse, which may include being asked to leave one's home by parents. When clinicians encourage adolescents to communicate openly with their parents, it is important to ask about reasons for any reluctance to do so. There are times when it may be appropriate to identify and engage other trusted adults. (SAM)

Leading medical organizations whose members provide care for adolescents have policies explicitly supporting the role of parents in adolescent health care. These organizations include:

American Academy of Family Physicians (AAFP)

American Academy of Pediatrics (AAP)

American College of Obstetricians and Gynecologists (ACOG)

American College of Physicians (ACP)

American Medical Association (AMA)

Society for Adolescent Medicine (SAM)

Medical organizations support confidential access for adolescents to medical care that protects their health, including reproductive health services

Many medical organizations reinforce the value of encouraging adolescents to involve their parents in their reproductive health care, but recognize that *requiring* parental involvement may not protect the patient's health. Medical organizations recognize that confidentiality in treating adolescents is particularly important for establishing trusting and honest communications that help teens to talk about sensitive topics. Confidentiality protections also encourage young people to seek care on a timely basis. Open communication between the adolescent and health professional is a prerequisite for careful counseling and assessment.

- Concern about confidentiality is one of the primary reasons that adolescents hesitate or delay obtaining reproductive health care, including contraceptive services, care related to sexually transmitted infections, or abortion services.
- Careful counseling and protection of confidentiality are both needed to appropriately address unintended pregnancy.
- Reproductive health services should be available on a confidential basis to adolescents who need them.
- Adolescents must have access to counseling about all options and have access to abortion without legal barriers.

In the organizations' own words:

"Confidential care for adolescents is critical to improving their health." (AMA)[8]

"The issue of confidentiality has been identified by both providers and young people themselves, as a significant access barrier to health care. (AAP, AAFP, ACOG, and other organizations)[2]

"Services for pregnant adolescents [should] include access to safe, legal, and confidential abortion counseling and services, as well as access to affordable, confidential prenatal and postpartum care and contraceptive services." (APHA)[10]

Medical organizations recognize that there are limits to confidentiality for adolescents

Medical organizations recognize that confidentiality is not absolute. Confidentiality must be overridden whenever a health care provider is concerned that the patient is in a life threatening situation and may do serious harm to self or others.

- Patient confidentiality should be protected unless the patient has given consent for disclosure or disclosure is required by law or the health care provider is concerned that the patient may harm himself or others.
- Health care providers should explain the meaning, scope and limitation of confidentiality protections to parents and guardians and to their adolescent patients.
- If breaching confidentiality is necessary, it should be done in a way that minimizes harm to the patient.

In the organizations' own words:

"Although confidentiality is important in adolescent health care, for adolescents at risk to themselves or others, confidentiality must be breached." (AAP)[4]

"The diagnosis [of pregnancy] should not be conveyed to others, including parents, until the [adolescent] patient's consent is obtained, except when there are concerns about suicide, homicide, or abuse." (AAP)[1]

Organizations with Policy Statements Recognizing the Importance of Confidentiality in Adolescent Health Care[13]

American Academy of Child & Adolescent Psychiatry (AACAP)

American Academy of Family Physicians (AAFP)

American Academy of Pediatric Dentistry (AAPD)

American Academy of Pediatrics (AAP)

American College of Emergency Physicians (ACEP)

American College Health Association (ACHA)

American College of Obstetricians and Gynecologists (ACOG)

American College of Physicians (ACP)

American College of Preventive Medicine (ACPM)

American Medical Association (AMA)

American Nurses Association (ANA)

American Psychiatric Association (APA1)

American Psychological Association (APA2)

American Public Health Association (APHA)

American School Health Association (ASHA)

National Assembly on School-Based Health Care (NASBHC)

National Association of Pediatric Nurse Practitioners (NAPNAP)

National Association of School Psychologists (NASP)

National Association of Social Workers (NASW)

Society for Adolescent Medicine (SAM)

Source: Morreale MC, Dowling EC, Stinnett AJ, Policy Compendium on Confidential Health Services for Adolescents, 2nd Edition. Chapel Hill, NC: Center for Adolescent Health & the Law

Medical organizations believe that laws should promote, not impede, adolescents' access to health care

Several medical organizations have endorsed policies stating that mandatory parental involvement should not be legislated. Some organizations recommend that health care providers advocate for public policies that protect adolescents' access to confidential health care and oppose efforts to repeal minor consent laws.

- Laws that allow minors to give their own consent for health care and that protect the confidentiality of adolescents' health information are fundamentally necessary to allow the health care professional to provide appropriate care and should be maintained.
- Efforts to repeal minor consent laws or to place limits on the confidentiality of services for minor patients should be opposed.
- Legal barriers and deference to parental involvement should not impede access to needed health care.
- Federal and state laws should support confidential access to health care for adolescents in any circumstance share limits on confidentiality would impede care.

In the organizations' own words:

"[T]he potential health risks to adolescents if they are unable to obtain reproductive health services are so compelling that legal barriers and deference to parental involvement should not stand in the way of needed health care for patients who request confidentiality." (AAP, AAFP, ACOG, SAM)[1]

"Genuine concern for the best interests of minors argues strongly against mandatory parental consent and notification laws. Although the stated intent of mandatory parental consent laws is to enhance family communication and parental responsibility, there is no supporting evidence that the laws have these effects. No evidence exists that legislation mandating parental involvement against the adolescent's wishes has any added benefit in improving productive family communication or affecting the outcome of the decision. There is evidence that such legislation may have an adverse impact on some families and that it increases the risk of medical and psychological harm to the adolescent. Judicial bypass provisions do not ameliorate the risk." (AAP)[5]

"The AAP holds that public policies can and should encourage voluntary involvement of parents or other mature adults, but specific laws mandating notification of biological parents or legal guardians as a condition of service are counterproductive" (AAP)[5]

"[T]he threat of compelled parental notification is a strong disincentive to an adolescent's seeking professional reproductive health care or advice; and ... parental involvement laws, whether notification or consent, for adolescent reproductive health care (including contraception, prenatal care, delivery services, postpartum care, or abortion), do not appreciably discourage adolescent sexual activity[.]" (APHA)[7]

"Physicians should not feel or be compelled to require minors to involve their parents before deciding whether to undergo an abortion." (AMA)[8]

"Although prevention of unwanted pregnancy is the highest priority, adolescents must have access to counseling about all options and elective termination of pregnancy as a legal, safe, available alternative to continuing pregnancy ... Mandatory parental consent or notification should not be required." (SAM)[10]

Leading medical and health care professional organizations whose members provide care for the vast majority of adolescents have policies explicitly opposing mandatory parental notification for adolescents' reproductive health care, including abortion:

American Academy of Family Physicians (AAFP)

American Academy of Pediatrics (AAP)

American College of Obstetricians and Gynecologists (ACOG)

American Medical Association (AMA)

American Public Health Association (APHA)

Society for Adolescent Medicine (SAM)

References

1. American Academy of Pediatrics, American Academy of Family Physicians, American College of Obstetricians and Gynecologists, and Society for Adolescent Medicine. "Protecting the Rights of Conscience of Health Care Providers and a Parent's Right to Know." Testimony presented by Renee Jenkins before the United States House of Representatives Committee on Energy and Commerce Subcommittee on Health. July 11, 2002.
2. American Academy of Pediatrics. "Confidentiality in Adolescent Health Care." Policy Statement RE9151. April 1989; Reaffirmed January 1993, November 1997, May 2000, and May 2004. Also endorsed by the American Academy of Family Physicians, the American College of Obstetricians and Gynecologists, NAACOG The Organization for Obstetric, Gynecologic, and Neonatal Nurses, and the National Medical Association.
3. American Academy of Pediatrics. "Counseling the Adolescent about Pregnancy Options." Committee on Adolescence. Policy Statement RE 9743. Pediatrics. 1998; 101 (5):938-940; Reaffirmed January 2001.
4. American Academy of Pediatrics. "Suicide and Suicide Attempts in Adolescents." Committee on Adolescence. Policy Statement RE9928. Pediatrics. 2000; 105 (4):871-874.
5. American Academy of Pediatrics. "The Adolescent's Right to Confidential Care When Considering Abortion." Committee on Adolescence. Policy Statement RE 9644. Pediatrics. 1996; 97(5):746-751; Reaffirmed May 1999 and November 2002.
6. American College of Obstetricians and Gynecologists. "Confidentiality in Adolescent Health Care." In: Health Care for Adolescents. Washington, DC: ACOG, 2003.
7. American Medical Association. "Confidential Care for Minors." Policy E 5.055. Issued June 1994 based on the report, "Confidential Care for Minors." Adopted June 1992; Updated June 1996.
8. American Medical Association. "Confidential Health Services for Adolescents." Policy H-60.965. CSA Rep. A, A-92; Reaffirmed by BOT Rep. 24, A-97; Reaffirmed by BOT Rep. 9, A-98.
9. American Medical Association. "Mandatory Parental Consent to Abortion." Policy E-2.015. Issued June 1994 based on the report, "Mandatory Parental Consent to Abortion." Adopted June 1992. JAMA. 1993; 269:82-86.
10. American Public Health Association. "Adolescent Access to Comprehensive, Confidential Reproductive Health Care." APHA Policy Statement # 9001. 1990.
11. Society for Adolescent Medicine. "Confidential Health Care for Adolescents: Position Paper of the Society for Adolescent Medicine. Journal of Adolescent Health 2004; 35:160-167.
12. Society for Adolescent Medicine. "Reproductive Health and Adolescents." Position Paper. Journal of Adolescent Health. 1991; 12:649-661.

Prepared by

Center for Adolescent Health & the Law

310 Kildaire Road, Suite 100

Chapel Hill, NC 27516

919.968.8850 phone / 919.968.8850 fax

www.cahl.org

September 2005

ALASKA PUBLIC HEALTH ASSOCIATION

Committed To Advancing Alaska's Public Health Since 1978

ALPHA

February 25, 2008

Representative_Jay_RAMRAS@legis.state.ak.us

Dear Representative Ramras:

The Alaska Public Health Association (ALPHA) represents 245 Alaskan public health professionals. The vision of the Alaska Public Health Association is that Alaskans shall have the knowledge and the means to live free of preventable illness and injury.

At the ALPHA annual meeting December 4, 2007 ALPHA passed Resolution 7-2007 Protecting and Enhancing Women's Ability to Obtain Safe, Legal Abortion Services.
http://www.alaskapublichealth.org/pdf/resolution/7-2007LateBreakerSafeLegalAbortion.pdf

ALPHA opposes HB 364 Notice and Consent for Minor's Abortion. ALPHA strongly opposes state laws that in any way limit access to safe, legal abortion services, including, but not limited to: a. mandatory delays and information/counseling that is not science-based, bans on specific abortion procedures, parental consent or notification requirements, targeted regulation of abortion providers, and limits for advanced practice clinicians in providing abortion services.

HB 364 is similar to the law mandating parental consent that was recently struck down by the Alaska Supreme Court in November 2007. Sending this issue through the legislature again uses up resources in a time-strapped legislative session. HB 364 raises serious issues about notification documentation and levies an unjustified burden on physicians who are described as the sole agents able to obtain consent and notification. Despite the intention to protect – mandatory notification and consent may result in a teen delaying speaking to anyone about a pregnancy and delay seeking medical services.

Cc: Representative_Nancy_DAHLSTROM@legis.state.ak.us
Representative_John_Coghill@legis.state.ak.us
Representative_Bob_LYNN@legis.state.ak.us
Representative_Ralph_SAMUELS@legis.state.ak.us
Representative_Max_GRUENBERG@legis.state.ak.us
Representative_Lindsey_HOLMES@legis.state.ak.us

P.O. Box 9-1825 Anchorage, AK 99509 907/332-1030 e-mail: publichealth@alaska.net www.alaskapublichealth.org

ALPHA Statement of Purpose: "The Alaska Public Health Association shall promote the advancement of public health to improve health and quality of life for all Alaskans. To this end, ALPHA will exercise leadership with public health professionals and the general public in developing sound health policy, reducing health disparities and improving health outcomes for Alaskans."

Members Only

Advocacy/Policy

Search the site

Advancing the Health and Well Being for Adolescents

Society for Adolescent Medicine Position Statements and Resolutions

Access to Health Care for Adolescents
Guidelines for Adolescent Health Research
Adolescent Inpatient Units
Adolescent Medicine
Clinical Preventive Services for Adolescents
Code of Research Ethics
Confidential Health Care for Adolescents
Corporal Punishment in Schools
Driver Education for Adolescents
Eating Disorders in Adolescents
Firearms and Adolescents
Hepatitis B Immunization
HIV Infection and AIDS in Adolescents
Health and Health Needs of Homeless and Runaway Youth
Immunization of Adolescents
Meeting the Health Care Needs of Adolescents in Managed Care
Improving the Nutritional Health of Adolescents
Reproductive Health Care for Adolescents
School-Based Health Clinics

Access to Health Care for Adolescents (March 1992)

Position papers summary

- Universal access to a basic level of health care for all adolescents
- Individual communities must decide how and where to provide confidential, appropriate care for their adolescents
- Providers must address the concerns of their adolescent patients and must help guide their development as independent agents with regard to their health
- Far-reaching societal commitments are needed to provide quality care for all adolescents, to improve the health of youth and to promote well-being into adulthood
- Proposals for health-care reform should be examined for their effect on adolescents using seven developed and adopted criteria: availability, visibility, quality, confidentiality, affordability, flexibility, and coordination

- **Availability**
  age-appropriate services and trained health care providers must be present in all communities
  location of services and hours of operation should consider the demography and activities of the target population

- **Visibility**
  health services must be recognizable, convenient, and should not require extensive or complex planning by parents or adolescents-need for services on a spontaneous basis
  outreach, including education about how to use the system and about the need for preventive care is an important component of adolescent health services

- **Quality**
  a basic level of service must be provided to all youth, and adolescents should be satisfied with care they receive
  health professionals must be able to deal confidently with a broad range of adolescent health concerns and should

demonstrate a basic level of competence

- **Confidentiality**
  adolescents should be encouraged to involve their families in health decisions whenever possible, however, when such involvement is not in the best interest of the adolescent or when parental involvement may prevent the adolescent from seeking care, confidentiality must be assured

- **Affordability**
  employment-based proposal for health insurance reform must cover adolescents either as employees or as dependents
  public and private insurance programs must provide adolescents with preventive services designed to promote healthy behaviors and decrease morbidity and mortality
  provider reimbursement must reflect the additional time and intensity needed to provide appropriate care to adolescents

- **Flexibility**
  services, providers, and delivery sites must consider the cultural, ethnic, and social diversity among adolescents
  providers must be able to assess an individual adolescent's developmental readiness and to assist youth in making the transition between pediatric and adult care

- **Coordination**
  service providers must coordinate the comprehensive services that influence the health behaviors of adolescents
  when services are categorical, mechanisms must exist to help adolescents pay for and obtain necessary care from multiple sites and providers
  providers must understand and facilitate entry to specialized services for those adolescents who require them

top

Firearms and Adolescents (August 1998)
Position papers summary

- Legislative and regulatory strategies to reduce availability of the primary source of firearms (e.g., handguns) injuries among adolescents, including restricting the purchase and possession of handguns by private citizens
- Regulations to reduce the severity of injuries from firearms by reductions in the destructive power of ammunition
- Adolescent health care providers to incorporate regular violence-prevention counseling into their health care activities
- The involvement of adolescent health care providers in public education campaigns about the dangers of guns and the need for gun control
- Participation by providers in the development of strong and active coalitions that bring together community members with diverse perspectives and expertise to promote the development and implementation of multidimensional, scientifically based strategies, interventions, and legislation to reduce firearm violence
- To identify, treat, and make appropriate referrals for youth at high risk for firearm injury, including those with depression, physical fighting, history of weapon-carrying, substance use, or exposure to family violence
- Research on firearm violence, including the scope of the problem on firearm injuries among youth, risk and protective factors for involvement in firearm violence and the effectiveness of intervention strategies to reduce firearm morbidity and mortality

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN

Search

ADOLESCENT ABORTION: VIEWS OF THE MEMBERSHIP OF THE AMERICAN ACADEMY OF PEDIATRICS

Copyright (c) American Academy of Pediatrics 1993

Pediatrics Volume 91, Number 3 March 1993

Gretchen V. Fleming, PhD, and Karen G. O'Connor

ABSTRACT. To identify the positions held by the American Academy of Pediatrics (AAP) membership on a number of issues that may be topics of legislation regarding abortion, the AAP carried out a survey based on a random sample of 1000 active US members. A total of 785 usable questionnaires were returned. The majority of members surveyed (56.7%) favored access to abortion for adolescents for all the reasons identified in the questionnaire; 35.4% believed abortion should clearly be restricted in some circumstances, and 7.0% believed adolescents should not have access to abortion under any circumstances. For each individual reason for abortion, at least 60% of the membership believed adolescents should have access to abortion services. In addition, most pediatricians supported legal positions that would facilitate access to abortion services for adolescents. Urban, female, and non-self-employed pediatricians were slightly more likely to support access to abortion by adolescents than comparison groups. Discussion focuses on the extent to which pediatricians' views reflect medical concerns, the extent to which their views are reflected in the current laws, and implications for practice and for AAP policy. Pediatrics 1993;91:561-565; adolescence, abortion, American Academy of Pediatrics.

ABBREVIATION. AAP, American Academy of Pediatrics.

Pregnancy among adolescents is one of the most prevalent health concerns for pediatricians. More than 1 million adolescents between the ages of 15 and 19 years have become pregnant each year since 1973; 4 of 10 adolescent women become pregnant at least once in their teens. Abortion is chosen by more than 40% of these women each year. [1]

Adolescent abortion is clearly a controversial issue, and the American Academy of Pediatrics (AAP) has long recognized that its members have diverse views on this topic, as evidenced in communications from and positions endorsed by individual members. Because of recent court decisions regarding abortion, the AAP is frequently asked to join other providers of health care to adolescents to ensure that any further legislation surrounding the issue of abortion reflects the best health care interests of adolescents. In 1990 the AAP surveyed its membership to determine their views on adolescent abortion and, by inference, on what constitutes the best interests of adolescents.

There is evidence that adolescent pregnancy when brought to term is associated with certain risks to both the mother and infant, although the risks are mostly related to social factors associated with adolescent childbearing and not to young age per se. [2-6] However, the greatest age-related effect of adolescent pregnancy is the high frequency of low birth weight infants and the resulting physical and developmental problems that occur in these infants. [7-11] In one study the children born to mothers younger than 18 years developed more slowly than those born to a group of mothers older than 18 who were otherwise matched on a series of social and economic characteristics. [12] Children of teenagers have been shown to be shorter, weigh less, have lower IQs, and be more distractible than those born to

older mothers. [12,13] Young children of teenage mothers have been shown to have higher fatal injury rates [14] and a higher rate of hospital admissions for injuries and gastroenteritis, although not for other illnesses examined. [15,16]

One study also indicated that pregnant teenagers who chose abortion did better on certain follow-up measures of social functioning, such as staying in and finishing high school and self-esteem, than did a group of teenagers who were pregnant and gave birth and another control group of teenagers who had a pregnancy test but were found not to be pregnant. [17]

It has been shown that abortion is safer than childbirth, particularly for adolescents younger than the age of 15. [18-20] Adolescents have similar or lower rates of complications following legal abortions than do older women, although reasons for this finding are not clear. [21] The evidence concerning mental health effects of abortion is generally negative or inconclusive. [22,23]

METHODS

The questions on issues surrounding abortion were included as part of the AAP's Periodic Survey of Fellows. Through this mechanism, the AAP queries a unique random sample of approximately 1000 active US Fellows of the Academy three or four times a year on a variety of topics selected to provide input to AAP programs. The survey on abortion issues was a self-administered six-page questionnaire. An original and four follow-up mailings to recontact the nonrespondents were conducted July through August of 1990. A total of 785 usable questionnaires were returned, with a final response rate of 76.5%. The characteristics of the respondents were consistent with those in previous periodic surveys and are representative of the AAP membership.

We first asked the membership, "Do you believe adolescents should have access to abortion?" We followed that question with a list of specific circumstances. Further questions addressed statements included in an amicus brief signed by the AAP [24] on forthcoming issues in state or federal legislatures. A few questions asked demographics and attributes of practice. In the analysis, where appropriate, Chi^2 tests of significance are used.

RESULTS

Almost all pediatricians in the study believed adolescents should have access to abortion at least under some circumstances. Nearly half of the respondents (48.9%) said they believed adolescents should have access to abortion under all circumstances, 43.8% said abortion for adolescents should be restricted to only some circumstances, and 7.3% indicated they did not believe adolescents should have access to abortion under any circumstances.

However, a group of those respondents who said abortion should be restricted to "some" circumstances also agreed that abortion should be permitted in every circumstance identified in the questionnaire. When they were grouped with those who favored access to abortion under all circumstances, the results indicated that the majority of AAP members (56.7%) favored access to abortion for adolescents for all reasons identified, 35.4% clearly felt abortion should be restricted in some circumstances, and 7.0% believed adolescents should not have access to abortion under any circumstances.

Table 1 presents the circumstances under which an adolescent might be permitted to seek an abortion. An overwhelming majority of members agreed that abortion should be an option for adolescents when it would preserve the physical health or life of the mother (91%) or when pregnancy was the result of rape or incest (88%). Presence of a fetal abnormality and preservation of the mental psychological health of the mother as reasons for abortion were favored by more than three fourths of the membership. Among all the possible circumstances for adolescent abortion, the two that were least favored, undesired pregnancy and socioeconomic hardship, were acceptable to more than 60% of the membership.

Table 2 shows the degree to which pediatricians agreed or disagreed with several controversial issues surrounding abortion legislation/regulation. Pediatricians overwhelmingly agreed (84.6%) that awareness of mandatory parental notification for an abortion would cause some adolescents to delay seeking an abortion. More than one half (56.6%) of pediatricians agreed with the statement that mandatory parental notification of an adolescent's decision to have an abortion jeopardized the patient's right to privacy and confidentiality. The majority of respondents did not support any of the remaining statements, all of which suggested the development of more stringent laws to regulate abortion

Pediatricians' views on parental notification of an adolescent's intention to seek abortion are further specified in

Table 3. Fifty-one percent of all pediatricians said there should not be laws mandating parental notification when an adolescent seeks an abortion; 48.8% said there should be such laws. With 95% confidence limits of approximately 3.6 percentage points on either side of these percentages, these results are ambiguous with regard to the view of the majority of pediatricians. Among those who think there should be laws mandating parental notification, 52.8% said the law should mandate notification of one biological parent/legal guardian with a provision allowing a judge to rule to bypass notification in cases of a mature minor or where it is not in the adolescent's best interest to notify the parent.

In an effort to understand better some of the personal and practice characteristics that affect pediatricians' opinions about the situations in which abortion should be available to adolescents, we compared responses by rural, small metropolitan, or urban residence; age; gender; and self-employed vs non-self-employed (for those who were in practice). These characteristics were chosen because they have been shown to affect pediatricians' opinions in the past and because they may offer some clues as to how opinions of pediatricians as a whole may shift in the future.

With regard to residence, the urban group was most likely to approve of abortion for adolescents, with 61.9% of the urban group, 55.2% of the small metropolitan, and 52.8% of the rural group supporting adolescents' access to abortion in all instances. The small metropolitan group was most likely to believe adolescents should have access to abortion in no circumstances (9.7% vs 4.5% for the urban group and 7.1% for the rural group). These results were not quite significant at the $P < .05$ level. Results by age, comparing those younger than 45 to those 45 and older, showed no differences. Gender and self-employed vs non-self-employed were also discriminating variables. Female pediatricians were significantly more likely to believe adolescents should have access to abortion in all circumstances (61.5% of female pediatricians supported this view vs 53.7% of male pediatricians) and were also more likely to support the statement that adolescents should have access to abortion under no circumstances (8.7% of female vs 6.1% of male pediatricians). Self-employed pediatricians were significantly less likely to believe adolescents should have access to abortion in all circumstances (50.3%) than were non-self-employed pediatricians (63.4%) and were also slightly more likely to believe adolescents should have access to abortion in no circumstances (8.8% for self-employed and 5.3% for non-self-employed).

Table 4 shows the circumstances under which an adolescent might be permitted an abortion by pediatricians' residence, gender, and self- vs non-self-employed status. For each of the specified circumstances, urban pediatricians and non-self-employed pediatricians were more likely to support adolescent access to abortion than comparison groups, although differences were not significant in many cases. For most circumstances, female pediatricians were more likely to approve of adolescent access to abortion than males, although that pattern did not hold for three of the circumstances. Only one difference in percent by gender was significant.

Table 5 shows differences in members' responses to the items presented in Table 2 by residence, gender, and self- vs non-self-employed status. Note that, for the sake of simplicity, only the percent who agreed with the statement is reported. However, the residual percent was divided between those who were neutral and those who disagreed (see Table 2). In some instances where significance between groups is reported it is due mostly to differences in the percentages who disagreed with the statement.

Patterns similar to those shown in Table 4 emerged. For residence there were no significant differences in the percentages supporting two statements that suggested that problems result from placing restrictions on access to abortion (the two listed first on the table). However, the rural group was generally most likely to support the statements advocating more restrictive laws to control abortion, the small metropolitan group was next most likely to support these statements, and the urban group was least likely to support these statements. By gender, all but one difference was in the direction of female pediatricians' being more likely to support the first two statements and more likely to reject the statements that support more restrictive abortion laws. By direct patient care, in all but one instance the self-employed were more likely to support the more restrictive position regarding adolescent abortion. Although most of these differences were not significant, the consistent trends in direction are unlikely to occur by chance.

DISCUSSION

There is general agreement in the literature that abortion is one of the safest medical procedures, with no clear evidence of long-term negative effects. In addition, although complications of pregnancy are greater for adolescents than for adult women, this is primarily due to social factors related to adolescent pregnancy--in particular, delay in seeking prenatal care. More serious are the developmental problems that are more likely to occur among children of

very young mothers. Given these empirically established facts, it is not surprising that most pediatricians in the AAP support adolescents' access to abortion from a medical point of view.

However, access to abortion is also an issue of personal values. The law can, to a great extent, be viewed as a barometer measuring the dominant values of a society on an issue. Recent United States Supreme Court actions, including the decision that the Pennsylvania law that declared an outright state ban on abortion was illegal, while some restrictions at the state level are still permitted, reflect the ambivalence of this nation regarding the abortion issue. As of this writing, 22 states had laws in effect addressing parental involvement in abortion decisions; 10 other states had such statutes but they had been enjoined or were not currently enforced. [25] Supreme Court decisions have upheld states' laws requiring parental consent or notification, but only if pregnant minors are allowed to go to court without involving their parents and if courts allow mature minors to make their own decisions. [26] This study shows that pediatricians as a group are also ambivalent about requiring parental notification of adolescent abortion, although pediatricians generally recognize the potential of such notification to cause some adolescents to delay in seeking an abortion.

Regardless of their personal views, pediatricians will be bound by the laws in the state in which they practice. To the extent that they provide primary care services to adolescents, they will need to keep abreast of the laws as they change in order to counsel adolescents on their medical options. In addition, as the primary health counselors in these families, they will need to practice skills that facilitate communication within families so that the options available to adolescents will be executed safely and in the best interest of all members of the family.

The majority views of the members of the AAP seem to provide a mandate for the Academy to support legislation facilitating access to abortion services for adolescents. We also explored some of the characteristics of pediatricians and their practices that are related to their views concerning adolescent access to abortion. Because the main purpose of the survey was to document their views overall and not to explain them, a complete model of explanatory variables was not attempted. We were able to learn that pediatricians' views tended to be related to residence and gender and, for practicing pediatricians, whether or not they were self-employed. More needs to be learned about the reasons for these relationships and whether or not they can be expected to be stable in the future.

REFERENCES

---

1. National Research Council. Risking the Future: Adolescent Sexuality, Pregnancy and Childbearing, I. Washington, DC: National Academy Press; 1987:51-58
2. Carey WB, McCann-Sanford T, Davidson EC Jr. Adolescent age and obstetric risk. In: McAnarney ER, ed. Premature Adolescent Pregnancy and Parenthood. New York, NY: Grune & Stratton; 1983:109-118
3. Friedman SB, Phillips S. Psychosocial risk to mother and child as a consequence of adolescent pregnancy. In: McAnarney ER, ed. Premature Adolescent Pregnancy and Parenthood. New York, NY: Grune & Stratton; 1983:269-277
4. Lawrence RA, Merritt TA. Infants of adolescent mothers: perinatal, neonatal, and infancy outcome. In: McAnarney ER, ed. Premature Adolescent Pregnancy and Parenthood. New York, NY: Grune & Stratton; 1983:149-167
5. Elster AB. The effect of maternal age, parity and prenatal care on perinatal outcome in adolescent mothers. Am J Obstet Gynecol. 1984; 149:845-847
6. McAnarney ER, Hendee WR. Adolescent pregnancy and its consequences. JAMA. 1989;262:74-77
7. Apte DV. A plan to prevent adolescent pregnancy and reduce infant mortality. Public Health Rep. 1987;102:80-86
8. Scholl TO, Miller LK, Salmon RW, Cofsky MC, Shearer J. Prenatal care adequacy and the outcome of adolescent pregnancy: effects on weight gain, preterm delivery and birth weight. Obstet Gynecol. 1987;69:312-316

9. Davis RA. Adolescent pregnancy and infant mortality: isolating the effects of race. Adolescence. 1988;23:899-908
10. Brown SS. Drawing women into prenatal care. Fam Plann Perspect. 1989; 21:73-80
11. National Center for Health Statistics. Advance Report on Final Natality Statistics 1989. Monthly Vital Statistics Report. Hyattsville, MD: Public Health Service; 1991:40 (8S)
12. Oppel WC, Royston AB. Teen-age births: some social, psychological, and physical sequelae. Am J Public Health. 1971;61:751-756
13. Hardy JB, Welcher DW, Stanley J, Dallas JR. Long-range outcome of adolescent pregnancy. Clin Obstet Gynecol. 1978;21:1215-1232
14. Wicklund K, Moss S, Frost F. Effects of maternal education, age, and parity on fatal infant accidents. Am J Public Health. 1984;74:1150-1152
15. Taylor B, Wadsworth J, Butler NR. Teenage mothering, admission to hospital, and accidents during the first 5 years. Arch Dis Child. 1983; 18:6-11
16. Wilson MD, Duggan AK, Joffe A. Rehospitalization of infants born to adolescent mothers. J Adolesc Health Care. 1990;11:510-515
17. Zabin LS, Hirsch MB, Emerson MR. When urban adolescents choose abortion: effects on education, psychological status and subsequent pregnancy. Fam Plann Perspect. 1989;21:248-255
18. Cates W, Schulz KF, Grimes DA. The risks associated with teenage abortion. N Engl J Med. 1983;309:621-624
19. Greydanus DE, Railsback LD. Abortion in adolescence. Semin Adolesc Med. 1985;1:213-214
20. Miller KA, Field CS. Adolescent pregnancy: critical review for the clinician. Semin Adolesc Med. 1985;1:195-212
21. Cates W, Schulz KF, Grimes DA. Morbidity and mortality of abortion in the United States. In: Hodgson JE, ed. Abortion and Sterilization: Medical and Social Aspects. New York, NY: Academic Press; 1981:155-180
22. Figa-Talamanca I. Abortion and mental health. In: Hodgson JE, ed. Abortion and Sterilization: Medical and Social Aspects. New York, NY: Academic Press; 1981:181-208
23. Adler NE, David HP, Major BN, Roth SH, Russo NF, Wyatt GE. Psychological responses after abortion. Science. 1990;248:41-44
24. Amicus Curiae briefs of the American College of Obstetricians and Gynecologists et al in Ohio v Akron Center for Reproductive Health, Minnesota v Hodgson, and Turnock v Ragsdale, US Supreme Court, October Term, 1989
25. Donovan P. Our Daughters' Decisions. New York, NY: The Alan Guttmacher Institute; 1992:30-35
26. Crosby MC, English A. Mandatory parental involvement/judicial bypass laws: do they promote adolescents' health? J Adolesc Health. 1991; 12:143-147

This work was carried out at the American Academy of Pediatrics, Elk Grove Village, IL.

Reprint requests to (G.V.F.) Dept of Research, American Academy of Pediatrics,

141 Northwest Point Blvd, PO Box 927, Elk Grove Village, IL 60009-0927.

(C) 1996 American Academy of Pediatrics

TABLE 1. Specific Circumstances Under Which Pediatricians Believe Abortion Should Be an Option for Adolescents (N=782)

Circumstance	%
To preserve the physical health or life of the mother	91.3
Pregnancy as a result of rape	88.1
Pregnancy as a result of incest	87.7
Fetal abnormality	82.2
Mentally retarded or otherwise incompetent mother	75.6
To preserve the mental/psychological health of the mother	74.0
Very young age of the mother (<15)	67.8
Unplanned/undesired pregnancy	62.1
Socioeconomic hardship	61.1

TABLE 2. Pediatricians' Opinions on Debatable Issues Surrounding Abortion (N=779)

Issue	Agree	Neutral	Disagree
Awareness of mandatory parental notification in the decision to have an abortion will cause some adolescents to delay seeking an abortion	84.6%	7.1%	8.3%
Mandatory parental notification of an adolescent's decision to have an abortion jeopardizes the patient's right to privacy and confidentiality	56.6	10.3	33.9
There should be laws to determine the circumstances under which abortion could be performed (rape, incest, etc)	37.5	6.2	56.3
There should be laws regarding physician compliance with parental	36.0	12.9	51.0

consent/notification laws			
There should be laws to require parental consent for abortion for adolescents	30.2	8.1	61.6
There should be laws to regulate abortion facilities to a greater extent than other medical facilities in which procedures of comparable risk are performed	29.2	13.3	57.5
Notification laws for abortion for pregnant adolescents should include notification of the adolescent's partner	27.8	17.8	54.4
There should be laws to specify when life begins	20.3	14.7	64.9
There should be laws to bar public employees or facilities from performing abortions	17.3	7.5	75.2
There should be laws to withhold public funds from private physicians who perform abortions	15.4	7.4	77.1
There should be government regulations that impose sanctions on physicians performing abortions	12.9	8.8	78.4
There should be laws to require physicians performing abortions to carry additional medical liability insurance	12.3	21.9	65.8

* Combines responses of "agree" and "strongly agree."
** Combines responses of "disagree" and "strongly disagree."

TABLE 3. Pediatricians' Opinions on Mandatory Parental Notification for Adolescent Abortion

	No.	%
Opinion		
Should be laws to mandate notification	381	48.8
Should not be laws to mandate notification	399	51.2
Total	780	100.0
Type of mandatory notification		
Notification of ONE biological parent guardian with provision for	198	52.8

judicial bypass		
Notification of ONE biological parent/guardian with no exceptions	70	18.7
Notification of BOTH biological parents/guardians with provision for judicial bypass	56	14.9
Notification of BOTH biological parents/guardians with no exceptions	51	13.6
Total	375	100.0

TABLE 4. Specific Circumstances Under Which Pediatricians Believe Abortion Should Be an Option for Adolescents by Residence, Gender, and Direct Patient Care Status *

Circumstance	Residence			Gender	
	Urban (n=312)	Small Metro (n=259)	Rural (n=127)	Male (n=507)	Female (n=264)
To preserve the physical health or life of the mother	93.9%	88.8%	91.3%	91.7%	90.5%
Pregnancy as a result of rape	91.7	85.3	87.4	88.6	87.1
Pregnancy as a result of incest	92.0**	84.9	86.6	88.2	86.7
Fetal abnormality	87.2***	77.1	82.7	81.9	82.6
Mentally retarded or otherwise incompetent mother	80.8**	72.5	72.4	73.8	78.8
To preserve the mental/psychological health of the mother	79.5**	70.2	70.9	72.8	75.8
Very young age of the mother (<15)	72.4	64.7	66.9	66.7	69.3
Unplanned/undesired pregnancy	68.6**	58.5	60.6	59.6	66.7
Socioeconomic hardship	67.0	53.5	58.3	58.0	66.3

TABLE 4. (cont.)

Circumstance	Direct Patient Care	
	Self-	Not Self-

	employed (n=320)	employed (n=284)
To preserve the physical health or life of the mother	89.7%	93.3%
Pregnancy as a result of rape	86.9	90.1
Pregnancy as a result of incest	86.6	89.8
Fetal abnormality	80.3	84.1
Mentally retarded or otherwise incompetent mother	72.5	78.4
To preserve the mental/psychological health of the mother	70.0**	78.8
Very young age of the mother (<15)	62.8***	74.2
Unplanned/undesired pregnancy	55.6	69.3
Socioeconomic hardship	53.4***	68.9

* Values are percentages.
** P< .05 that percentages for all groups on variable are equal.
*** P< .01 that percentages for all groups on variable are equal.

TABLE 5. Pediatricians' Opinions on Debatable Issues Surrounding Abortion: Percent Who Agree* With Each Statement by Residence, Gender, and Direct Patient Care Status

Circumstance	Residence			Gender	
	Urban	Small Metro	Rural	Male	Female
	(n=312)	(n=259)	(n=127)	(n=507)	(n=264)
Awareness of mandatory parental notification in the decision to have an abortion will cause some adolescents to delay seeking an abortion	86.5%	85.2%	86.6%	84.2%	87.0%
Mandatory parental notification of an adolescent's decision to have an abortion jeopardizes the patient's right to privacy and confidentiality	60.3	54.5	56.3	53.8**	62.6
There should be laws to determine the circumstances under which abortion	31.5***	36.8	50.8	39.6	32.1

could be performed (rape, incest, etc)					
There should be laws regarding physician compliance with parental consent/notification laws	34.1	34.5	40.5	40.0***	28.2
There should be laws to require parental consent for abortion for adolescents	26.0	30.7	34.6	33.3***	24.0
There should be laws to regulate abortion facilities to a greater extent than other medical facilities in which procedures of comparable risk are performed	23.5	29.2	34.1	30.0	27.1
Notification laws for abortion for pregnant adolescents should include notification of the adolescent's partner	24.5**	23.3	41.6	31.3***	20.3
There should be laws to specify when life begins	18.9	19.8	22.8	21.7	17.2
There should be laws to bar public employees or facilities from performing abortions	12.3	18.7	21.6	19.2	12.9
There should be laws to withhold public funds from private physicians who perform abortions	12.9	16.7	16.5	17.2	11.4
There should be government regulations that impose sanctions on physicians performing abortions	10.0	15.6	12.0	13.9	10.7
There should be laws to require physicians performing abortions to carry additional medical liability insurance	11.0	10.9	13.4	10.3	15.3

Table 5. (Cont.)

Circumstance	Direct Patient Care	
	Self-employed (n=320)	Not Self-employed (n=284)
Awareness of mandatory parental notification in the decision to have an abortion will cause some adolescents to delay seeking an abortion	84.0%	90.1%

Mandatory parental notification of an adolescent's decision to have an abortion jeopardizes the patient's right to privacy and confidentiality	52.5	60.4
There should be laws to determine the circumstances under which abortion could be performed (rape, incest, etc)	42.1***	33.0
There should be laws regarding physician compliance with parental consent/notification laws	41.6***	30.7
There should be laws to require parental consent for abortion for adolescents	34.1**	25.8
There should be laws to regulate abortion facilities to a greater extent than other medical facilities in which procedures of comparable risk are performed	29.2**	29.3^
Notification laws for abortion for pregnant adolescents should include notification of the adolescent's partner	32.2	25.4
There should be laws to specify when life begins	22.9	17.4
There should be laws to bar public employees or facilities from performing abortions	20.5***	12.7^
There should be laws to withhold public funds from private physicians who perform abortions	17.6***	12.6^
There should be government regulations that impose sanctions on physicians performing abortions	13.6***	11.6^
There should be laws to require physicians performing abortions to carry additional medical liability insurance	12.6	11.7

---

* Combines responses of "agree" and "strongly agree."

** P < .05 that percentages for all groups on variable are equal based on a
Chi^2 test of significance. Test is based on three value dependent variable:
agree, neutral and disagree (see Table 2).

*** P < .01 that percentages for all groups on variable are equal based on a

Chi^2 test of significance. Test is based on three-value dependent variable:
agree, neutral, and disagree (see Table 2).

^ Differences are significant largely because of larger differences in
percent
w ho disagree vs those who are neutral, with percent larger for non-
self-
employed groups.

E-2.015 Mandatory Parental Consent to Abortion

Physicians should ascertain the law in their state on parental involvement to ensure that their procedures are consistent with their legal obligations

Physicians should strongly encourage minors to discuss their pregnancy with their parents Physicians should explain how parental involvement can be helpful and that parents are generally very understanding and supportive If a minor expresses concerns about parental involvement, the physician should ensure that the minor's reluctance is not based on any misperceptions about the likely consequences of parental involvement

Physicians should not feel or be compelled to require minors to involve their parents before deciding whether to undergo an abortion The patient, even an adolescent, generally must decide whether, on balance, parental involvement is advisable Accordingly minors should ultimately be allowed to decide whether parental involvement is appropriate Physicians should explain under what circumstances (eg life-threatening emergency) the minor's confidentiality will need to be abrogated

Physicians should try to ensure that minor patients have made an informed decision after giving careful consideration to the issues involved They should encourage their minor patients to consult alternative sources if parents are not going to be involved in the abortion decision Minors should be urged to seek the advice and counsel of those adults in whom they have confidence including professional counselors relatives friends, teachers, or the clergy (III IV)

Issued June 1994 based on the report "Mandatory Parental Consent to Abortion," adopted June 1992 (*JAMA* 1993 269 82 86)

Planned Parenthood
of Alaska

Oppose House Bill 364
Keep Teens Safe!

Teenagers are talking to their parents.
In 2004 Planned Parenthood of Alaska began providing abortion services. Between January 2005 and December 2007, of the 19 minors aged 16 and under who requested abortion services, only 2 per year have not come accompanied by a parent. In Alaska, sexually active teens who have unplanned pregnancies are talking to their parents. Only in very rare cases, usually associated with abuse, have teens not involved a parent.

Good family communication cannot be mandated by government.
The best way to protect teenagers is for parents to begin talking about responsible sexual behavior from the time they are young and foster an atmosphere of trust, respect, and compassion that assures teens they can come to them with problems or questions. The government should not be intruding into personal family situations.

Keeping teenagers safe should be the top priority.
Parents want their teenagers to be safe. Despite the intention to protect – mandatory notification and consent will result in a teen delaying speaking to anyone about a pregnancy and delay seeking medical services. Teens in troubled families are truly at risk.

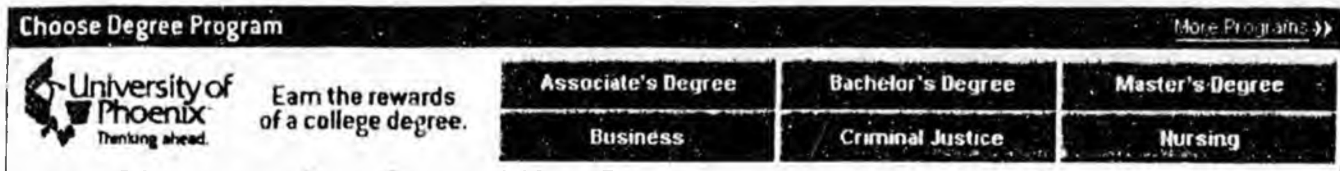
Consent and notification laws have undesirable consequences.
States who have enacted parental consent laws have seen an increase in late term abortions obtained by teens. The proportion of second trimester abortions among minors in Missouri increased by 17 percent after the state passed a parental consent law. Further, when access to abortion is restricted, complicated, or intimidating women still get abortions.

Confidentiality of the teen is not explicitly protected in the judicial bypass process.

HB 364 is unconstitutional.
HB 364 is an unconstitutional bill that requires parental consent and notification. A similar law mandating parental consent was just struck down by the Alaska Supreme Court in November 2007; revisiting this issue is a waste of state time and money.

Parents, teens, and Planned Parenthood of Alaska are putting prevention to work.
Between January 2005 and December 2007 PPA's Anchorage and Fairbanks clinics provided family planning and pregnancy prevention services to 2000 teens. Sexually active teens are taking responsibility for their reproductive health care.

Planned Parenthood of Alaska respects the choice of every client, including teens.
More teens are brought in for an abortion by their parents where the teen wants to continue the pregnancy, than teens that do not tell their parents about their abortion. PPA helps these teens get the services they need and refers them for prenatal care. Since the decision is up to the teen this is an easy process and ensures they obtain early prenatal care for a healthy pregnancy and a healthy baby.



Back to Article Click to Print

Monday, May. 10, 2004

What Makes Teens Tick?

By CLAUDIA WALLIS

Five young men in sneakers and jeans troop into a waiting room at the National Institutes of Health Clinical Center in Bethesda, Md., and drape themselves all over the chairs in classic collapsed-teenager mode, trailing backpacks, a CD player and a laptop loaded with computer games. It's midafternoon, and they are, of course, tired, but even so their presence adds a jangly, hormonal buzz to the bland, institutional setting. Fair-haired twin Corey and Skyler Mann, 16, and their burlier big brothers Anthony and Brandon, 18, who are also twins, plus eldest brother Christopher, 22, are here to have their heads examined. Literally. The five brothers from Orem, Utah, are the latest recruits to a giant study that's been going on in this building since 1991. Its goal: to determine how the brain develops from childhood into adolescence and on into early adulthood.

It is the project of Dr. Jay Giedd (pronounced Geed), chief of brain imaging in the child psychiatry branch at the National Institute of Mental Health. Giedd, 43, has devoted the past 13 years to peering inside the heads of 1,800 kids and teenagers using high-powered magnetic resonance imaging (MRI). For each volunteer, he creates a unique photo album, taking MRI snapshots every two years and building a record as the brain morphs and grows. Giedd started out investigating the developmental origins of attention-deficit/hyperactivity disorder (ADHD) and autism ("I was going alphabetically," he jokes) but soon discovered that so little was known about how the brain is supposed to develop that it was impossible to figure out where things might be going wrong. In a way, the vast project that has become his life's work is nothing more than an attempt to establish a gigantic control group. "It turned out that normal brains were so interesting in themselves," he marvels. "And the adolescent studies have been the most surprising of all." Before the imaging studies by Giedd and his collaborators at UCLA, Harvard, the Montreal Neurological Institute and a dozen other institutions, most scientists believed the brain was largely a finished product by the time a child reached the age of 12. Not only is it full-grown in size, Giedd explains, but "in a lot of psychological literature, traced back to [Swiss psychologist Jean] Piaget, the highest rung in the ladder of cognitive development was about age 12—formal operations." In the past, children entered initiation rites and started learning trades at about the onset of puberty. Some theorists concluded from this that the idea of adolescence was an artificial construct, a phenomenon invented in the post-Industrial Revolution years. Giedd's scanning studies proved what every parent of a teenager knows: not only is the brain of the adolescent far from mature, but both gray and white matter undergo extensive structural changes well past puberty. "When we started," says Giedd, "we thought we'd follow kids until about 18 or 20. If we had to pick a number now, we'd

probably go to age 25." Now that MRI studies have cracked open a window on the developing brain, other researchers are looking at how the newly detected physiological changes might account for the adolescent behaviors so familiar to parents: emotional outbursts, reckless risk taking and rule breaking, and the impassioned pursuit of sex, drugs and rock 'n' roll. Some experts believe the structural changes seen at adolescence may explain the timing of such major mental illnesses as schizophrenia and bipolar disorder. These diseases typically begin in adolescence and contribute to the high rate of teen suicide.

Increasingly, the wild conduct once blamed on "raging hormones" is being seen as the by-product of two factors: a surfeit of hormones, yes, but also a paucity of the cognitive controls needed for mature behavior.

In recent years, Giedd has shifted his focus to twins, which is why the Manns are such exciting recruits. Although most brain development seems to follow a set plan, with changes following cues that are preprogrammed into genes, other, subtler changes in gray matter reflect experience and environment. By following twins, who start out with identical—or, in fraternal twins, similar—programming but then diverge as life takes them on different paths, he hopes to tease apart the influences of nature and nurture. Ultimately, he hopes to find, for instance, that Anthony Mann's plan to become a pilot and Brandon's to study law will lead to brain differences that are detectable on future mris. The brain, more than any other organ, is where experience becomes flesh.

Throughout the afternoon, the Mann brothers take turns completing tests of intelligence and cognitive function. Between sessions they occasionally needle one another in the waiting room. "If the other person is in a bad mood, you've got to provoke it," Anthony asserts slyly. Their mother Nancy Mann, a sunny paragon of patience who has three daughters in addition to the five boys, smiles and rolls her eyes.

Shortly before 5 p.m., the Manns head downstairs to the imaging floor to meet the magnet. Giedd, a trim, energetic man with a reddish beard, twinkly blue eyes and an impish sense of humor, greets Anthony and tells him what to expect. He asks Anthony to remove his watch, his necklace and a high school ring, labeled keeper. Does Anthony have any metal in his body? Any piercings? Not this clean-cut, soccer-playing Mormon. Giedd tapes a vitamin E capsule onto Anthony's left cheek and one in each ear. He explains that the oil-filled capsules are opaque to the scanner and will define a plane on the images, as well as help researchers tell left from right. The scanning will take about 15 minutes, during which Anthony must lie completely still. Dressed in a red sweat shirt, jeans and white K-Swiss sneakers, he stretches out on the examining table and slides his head into the machine's giant magnetic ring.

MRI, Giedd points out, "made studying healthy kids possible" because there's no radiation involved. (Before MRI, brain development was studied mostly by using cadavers.) Each of the Mann boys will be scanned three times. The first scan is a quick survey that lasts one minute. The second lasts two minutes and looks for any damage or abnormality. The third is 10 minutes long and taken at maximum resolution. It's the money shot. Giedd watches as Anthony's brain appears in cross section on a computer screen. The machine scans 124 slices, each as thin as a dime. It will take 20 hours of computer time to process the images, but the analysis is done by humans, says

Giedd. "The human brain is still the best at pattern recognition," he marvels.

Some people get nervous as the MRI machine clangs noisily.

Claustrophobes panic. Anthony, lying still in the soul of the machine, simply falls asleep.

CONSTRUCTION AHEAD

one reason scientists have been surprised by the ferment in the teenage brain is that the brain grows very little over the course of childhood. By the time a child is 6, it is 90% to 95% of its adult size. As a matter of fact, we are born equipped with most of the neurons our brain will ever have—and that's fewer than we have in utero. Humans achieve their maximum brain-cell density between the third and sixth month of gestation—the culmination of an explosive period of prenatal neural growth. During the final months before birth, our brains undergo a dramatic pruning in which unnecessary brain cells are eliminated. Many neuroscientists now believe that autism is the result of insufficient or abnormal prenatal pruning.

What Giedd's long-term studies have documented is that there is a second wave of proliferation and pruning that occurs later in childhood and that the final, critical part of this second wave, affecting some of our highest mental functions, occurs in the late teens. Unlike the prenatal changes, this neural waxing and waning alters not the number of nerve cells but the number of connections, or synapses, between them. When a child is between the ages of 6 and 12, the neurons grow bushier, each making dozens of connections to other neurons and creating new pathways for nerve signals. The thickening of all this gray matter—the neurons and their branchlike dendrites—peaks when girls are about 11 and boys 121/2, at which point a serious round of pruning is under way. Gray matter is thinned out at a rate of about 0.7% a year, tapering off in the early 20s. At the same time, the brain's white matter thickens. The white matter is composed of fatty myelin sheaths that encase axons and, like insulation on a wire, make nerve-signal transmissions faster and more efficient. With each passing year (maybe even up to age 40) myelin sheaths thicken, much like tree rings. During adolescence, says Giedd, summing up the process, "you get fewer but faster connections in the brain." The brain becomes a more efficient machine, but there is a trade-off: it is probably losing some of its raw potential for learning and its ability to recover from trauma.

Most scientists believe that the pruning is guided both by genetics and by a use-it-or-lose-it principle. Nobel prizewinning neuroscientist Gerald Edelman has described that process as "neural Darwinism"—survival of the fittest (or most used) synapses. How you spend your time may be critical. Research shows, for instance, that practicing piano quickly thickens neurons in the brain regions that control the fingers. Studies of London cab drivers, who must memorize all the city's streets, show that they have an unusually large hippocampus, a structure involved in memory. Giedd's research suggests that the cerebellum, an area that coordinates both physical and mental activities, is particularly responsive to experience, but he warns that it's too soon to know just what drives the buildup and pruning phases. He's hoping his studies of twins will help answer such questions: "We're looking at what they eat, how they spend their time—is it video games or sports? Now the fun begins," he says.

No matter how a particular brain turns out, its development proceeds in stages, generally from back to front

Some of the brain regions that reach maturity earliest—through proliferation and pruning—are those in the back of the brain that mediate direct contact with the environment by controlling such sensory functions as vision, hearing, touch and spatial processing. Next are areas that coordinate those functions: the part of the brain that helps you know where the light switch is in your bathroom even if you can't see it in the middle of the night. The very last part of the brain to be pruned and shaped to its adult dimensions is the prefrontal cortex, home of the so-called executive functions—planning, setting priorities, organizing thoughts, suppressing impulses, weighing the consequences of one's actions. In other words, the final part of the brain to grow up is the part capable of deciding, I'll finish my homework and take out the garbage, and then I'll IM my friends about seeing a movie.

"Scientists and the general public had attributed the bad decisions teens make to hormonal changes," says Elizabeth Sowell, a UCLA neuroscientist who has done seminal MRI work on the developing brain.

"But once we started mapping where and when the brain changes were happening, we could say, Aha, the part of the brain that makes teenagers more responsible is not finished maturing yet."

RAGING HORMONES

Hormones, however, remain an important part of the teen-brain story.

Right about the time the brain switches from proliferating to pruning, the body comes under the hormonal assault of puberty.

(Research suggests that the two events are not closely linked because brain development proceeds on schedule even when a child experiences early or late puberty.) For years, psychologists attributed the intense, combustible emotions and unpredictable behavior of teens to this biochemical onslaught. And new research adds fresh support. At puberty, the ovaries and testes begin to pour estrogen and testosterone into the bloodstream, spurring the development of the reproductive system, causing hair to sprout in the armpits and groin, wreaking havoc with the skin, and shaping the body to its adult contours. At the same time, testosterone-like hormones released by the adrenal glands, located near the kidneys, begin to circulate.

Recent discoveries show that these adrenal sex hormones are extremely active in the brain, attaching to receptors everywhere and exerting a direct influence on serotonin and other neurochemicals that regulate mood and excitability.

The sex hormones are especially active in the brain's emotional center—the limbic system. This creates a "tinderbox of emotions," says Dr. Ronald Dahl, a psychiatrist at the University of Pittsburgh.

Not only do feelings reach a flash point more easily, but adolescents tend to seek out situations where they can allow their emotions and passions to run wild. "Adolescents are actively looking for experiences to create intense feelings," says Dahl. "It's a very important hint that there is some particular hormone-brain relationship

contributing to the appetite for thrills, strong sensations and excitement." This thrill seeking may have evolved to promote exploration, an eagerness to leave the nest and seek one's own path and partner. But in a world where fast cars, illicit drugs, gangs and dangerous liaisons beckon, it also puts the teenager at risk.

That is especially so because the brain regions that put the brakes on risky, impulsive behavior are still under construction. "The parts of the brain responsible for things like sensation seeking are getting turned on in big ways around the time of puberty," says Temple University psychologist Laurence Steinberg. "But the parts for exercising judgment are still maturing throughout the course of adolescence. So you've got this time gap between when things impel kids toward taking risks early in adolescence, and when things that allow people to think before they act come online. It's like turning on the engine of a car without a skilled driver at the wheel."

DUMB DECISIONS

Increasingly, psychologists like steinberg are trying to connect the familiar patterns of adolescents' wacky behavior to the new findings about their evolving brain structure. It's not always easy to do. "In all likelihood, the behavior is changing because the brain is changing," he says. "But that is still a bit of a leap." A critical tool in making that leap is functional magnetic resonance imaging (FMRI). While ordinary MRI reveals brain structure, FMRI actually shows brain activity while subjects are doing assigned tasks.

At McLean Hospital in Belmont, Mass., Harvard neuropsychologist Deborah Yurgelun-Todd did an elegant series of FMRI experiments in which both kids and adults were asked to identity the emotions displayed in photographs of faces. "In doing these tasks," she says, "kids and young adolescents rely heavily on the amygdala, a structure in the temporal lobes associated with emotional and gut reactions.

Adults rely less on the amygdala and more on the frontal lobe, a region associated with planning and judgment." While adults make few errors in assessing the photos, kids under 14 tend to make mistakes.

In particular, they identify fearful expressions as angry, confused or sad. By following the same kids year after year, Yurgelun-Todd has been able to watch their brain-activity pattern—and their judgment—mature. Fledgling physiology, she believes, may explain why adolescents so frequently misread emotional signals, seeing anger and hostility where none exists. Teenage ranting ("That teacher hates me!") can be better understood in this light.

At Temple University, Steinberg has been studying another kind of judgment: risk assessment. In an experiment using a driving-simulation game, he studies teens and adults as they decide whether to run a yellow light. Both sets of subjects, he found, make safe choices when playing alone. But in group play, teenagers start to take more risks in the presence of their friends, while those over age 20 don't show much change in their behavior. "With this manipulation," says Steinberg, "we've shown that age differences in decision making and judgment may appear under conditions that are emotionally arousing or have high social impact." Most teen crimes, he says, are committed by kids in packs.

Other researchers are exploring how the adolescent propensity for uninhibited risk taking propels teens to experiment with drugs and alcohol. Traditionally, psychologists have attributed this experimentation to peer pressure, teenagers' attraction to novelty and their roaring interest in loosening sexual inhibitions. But researchers have raised the possibility that rapid changes in dopamine-rich areas of the brain may be an additional factor in making teens vulnerable to the stimulating and addictive effects of drugs and alcohol Dopamine, the brain chemical involved in motivation and in reinforcing behavior, is particularly abundant and active in the teen years.

Why is it so hard to get a teenager off the couch and working on that all important college essay? You might blame it on their immature nucleus accumbens, a region in the frontal cortex that directs motivation to seek rewards. James Bjork at the National Institute on Alcohol Abuse and Alcoholism has been using FMRI to study motivation in a challenging gambling game. He found that teenagers have less activity in this region than adults do. "If adolescents have a motivational deficit, it may mean that they are prone to engaging in behaviors that have either a really high excitement factor or a really low effort factor, or a combination of both." Sound familiar?

Bjork believes his work may hold valuable lessons for parents and society. "When presenting suggestions, anything parents can do to emphasize more immediate payoffs will be more effective," he says. To persuade a teen to quit drinking, for example, he suggests stressing something immediate and tangible—the danger of getting kicked off the football team, say—rather than a future on skid row.

Persuading a teenager to go to bed and get up on a reasonable schedule is another matter entirely. This kind of decision making has less to do with the frontal lobe than with the pineal gland at the base of the brain. As nighttime approaches and daylight recedes, the pineal gland produces melatonin, a chemical that signals the body to begin shutting down for sleep Studies by Mary Carskadon at Brown University have shown that it takes longer for melatonin levels to rise in teenagers than in younger kids or in adults, regardless of exposure to light or stimulating activities. "The brain's program for starting nighttime is later," she explains.

PRUNING PROBLEMS

The new discoveries about teenage brain development have prompted all sorts of questions and theories about the timing of childhood mental illness and cognitive disorders. Some scientists now believe that ADHD and Tourette's syndrome, which typically appear by the time a child reaches age 7, may be related to the brain proliferation period. Though both disorders have genetic roots, the rapid growth of brain tissue in early childhood, especially in regions rich in dopamine, "may set the stage for the increase in motor activities and tics," says Dr. Martin Teicher, director of developmental biopsychiatry research at McLean Hospital. "When it starts to prune in adolescence, you often see symptoms recede." Schizophrenia, on the other hand, makes its appearance at about the time the prefrontal cortex is getting pruned. "Many people have speculated that schizophrenia may be due to an abnormality in the pruning process," says Teicher. "Another hypothesis is that schizophrenia has a much earlier, prenatal origin, but as the brain prunes, it gets unmasked." MRI studies have shown that while the average teenager loses about 15% of his cortical gray matter, those who develop schizophrenia lose as much as 25%.

WHAT'S A PARENT TO DO?

Brain scientists tend to be reluctant to make the leap from the laboratory to real-life, hard-core teenagers. Some feel a little burned by the way earlier neurological discoveries resulted in Baby Einstein tapes and other marketing schemes that misapplied their science. It is clear, however, that there are implications in the new research for parents, educators and lawmakers.

In light of what has been learned, it seems almost arbitrary that our society has decided that a young American is ready to drive a car at 16, to vote and serve in the Army at 18 and to drink alcohol at 21.

Giedd says the best estimate for when the brain is truly mature is 25, the age at which you can rent a car. "Avis must have some pretty sophisticated neuroscientists," he jokes. Now that we have scientific evidence that the adolescent brain is not quite up to scratch, some legal scholars and child advocates argue that minors should never be tried as adults and should be spared the death penalty. Last year, in an official statement that summarized current research on the adolescent brain, the American Bar Association urged all state legislatures to ban the death penalty for juveniles. "For social and biological reasons," it read, "teens have increased difficulty making mature decisions and understanding the consequences of their actions."

Most parents, of course, know this instinctively. Still, it's useful to learn that teenage behavior is not just a matter of willful pigheadedness or determination to drive you crazy—though these, too, can be factors. "There's a debate over how much conscious control kids have," says Giedd, who has four "teenagers in training" of his own. "You can tell them to shape up or ship out, but making mistakes is part of how the brain optimally grows." It might be more useful to help them make up for what their brain still lacks by providing structure, organizing their time, guiding them through tough decisions (even when they resist) and applying those time-tested parental virtues: patience and love.

With reporting by With Reporting by Alice Park/New York

Find this article at:
http://www.time.com/time/magazine/article/0,9171,631970,00.html

FRONTLINE

Adolescent Brains are Works in Progress

Here's Why

by FRONTLINE producer Sarah Spinks

Over the past 25 years, neuroscientists have discovered a great deal about the architecture and function of the brain. Their discoveries have led to huge strides in medicine, from pinpointing the timing at which children should be operated on for vision problems to shedding light on the mechanisms that cause such diseases as schizophrenia. Much of the early focus of the research was on the early years of development or on diseased brains. Now, with the advent of new imaging techniques, researchers are able to examine normal brains and brains of people throughout their lives.

Sarah Spinks is an independent director and producer. She was with the Canadian Broadcasting Corporation for 17 years, where her documentaries won many awards. Spinks' last FRONTLINE documentary, "Making Babies," reported on state-of-the-art infertility treatments.

More Information

See more about MRI's and fMRI's from PBS's "Secret Life of the Brain" web site.

Before the advent of magnetic resonance imaging (MRI), scientists already knew a lot about how the brain functioned. When people suffered brain damage or injury to particular parts of the brain, scientists could see what functions were impaired, and infer that the injured areas governed those functions. For example, people who had strokes in the area of the brain affecting speech lost the ability to speak. Autopsies showed when particular parts of the brain matured, the connections were wrapped in white matter, or myelin.

With functional MRIs, researchers can see how the brain actually functions -- what parts of the brain use energy when performing certain tasks. They know, for instance, the particular part of the brain that "lights up" when performing a visual task. Those images in which brain activity is measured are called "functional" because they measure how the brain performs tasks rather than simply mapping out the structure of the brain.

FRONTLINE's "Inside the Teenage Brain" focuses on work done by Dr. Jay Giedd at the National Institute of Mental Health in Bethesda, Md., together with colleagues at McGill University in Montreal. In a particularly interesting study, Dr. Giedd looked at the brains of 145 normal children by

scanning them at two-year intervals. This was work Giedd was only able to do with magnetic resonance imaging, because it requires neither harmful dyes nor radiation, making the study of normal children, as opposed to sick ones, ethically tenable.

"If a teen is doing music, sports or academics, those are the connections that will be hard wired. If they're lying on the couch or playing video games or MTV, those are the cells and connections that are going to survive."

What the researchers have found has shed light on how the brain grows and when it grows. It was thought at one time that the foundation of the brain's architecture was laid down by the time a child is five or six. Indeed, 95 percent of the structure of the brain has been formed by then. But these researchers have discovered changes in the structure of the brain that appear relatively late in child development.

Changes in the Prefrontal Cortex

Giedd and his colleagues found that in an area of the brain called the prefrontal cortex, the brain appeared to be growing again just before puberty. The prefrontal cortex sits just behind the forehead. It is particularly interesting to scientists because it acts as the CEO of the brain, controlling planning, working memory, organization, and modulating mood. As the prefrontal cortex matures, teenagers can reason better, develop more control over impulses and make judgments better. In fact, this part of the brain has been dubbed "the area of sober second thought."

The fact that this area was still growing surprised the scientists. Although they knew that the brain of a baby grew by over-producing synapses, or connections, they had not known that there was a second period of over-production. In a baby, the brain over-produces brain cells (neurons) and connections between brain cells (synapses) and then starts pruning them back around the age of three. The process is much like the pruning of a tree. By cutting back weak branches, others flourish. The second wave of synapse formation described by Giedd showed a spurt of growth in the frontal cortex just before puberty (age 11 in girls, 12 in boys) and then a pruning back in adolescence.

Even though it may seem that having a lot of synapses is a particularly good thing, the brain actually consolidates learning by pruning away synapses and wrapping white matter (myelin) around other connections to stabilize and strengthen them. The period of pruning, in which the brain actually loses gray matter, is as important for brain development as is the period of growth. For instance, even though the brain of a teenager between 13 and 18 is maturing, they are losing 1 percent of their gray matter every year.

Giedd hypothesizes that the growth in gray matter followed by the pruning of connections is a particularly important stage of brain development in which what teens do or do not do can affect them for the rest of their lives

He calls this the "use it or lose it principle," and tells FRONTLINE. "If a teen is doing music or sports or academics, those are the cells and connections that will be hardwired. If they're lying on the couch or playing video games or MTV, those are the cells and connections that are going to survive."

Corpus Callosum and Cerebellum

In another study of growth patterns of the developing brain, Paul Thompson of the University of California at Los Angeles, along with Jay Giedd and colleagues from McGill University, found waves of growth in the corpus callosum, a fiber system that relays information between the hemispheres of the brain. Of particular interest to educators and parents is their finding that the fiber systems influencing language learning and associative thinking grew more rapidly than surrounding regions before and during puberty (a similar period to the growth of the frontal cortex), but fell off shortly after. These findings reinforce studies on language acquisition that show that the ability to learn new languages declines after the age of 12. [1]

These studies of the corpus callosum are part of a large multi-centered research study on twins. Researchers are hopeful that twin studies will also shed light on the age-old question of nature or nurture -- which traits and characteristics are due to genetics and which can be affected by the environment. For instance, the studies have shown that the corpus callosi of twins are so similar that one can put 10 twin brain MRIs on view and even a novice can spot the pairs. The researchers therefore hypothesize that this part of the brain is largely controlled by genes. However, another piece of neuroanatomy, the cerebellum, at the back of the head just above the neck, is not very similar in twins, leading Giedd to hypothesize that the cerebellum is not genetically controlled and is thus susceptible to the environment.

Interestingly, the cerebellum is a part of the brain that changes well into adolescence. Scientists think the cerebellum helps in physical coordination. But looking at functional imaging studies of the brain, researchers also see activity in the cerebellum when the brain is processing mental tasks. Giedd thinks it works like this. "It's like a math co-processor. It's not essential for any activity ... but it makes any activity better. Anything we can think of as higher thought, mathematics, music, philosophy, decision-making, social skill, draws upon the cerebellum. ... To navigate the complicated social life of the teen and to get through these things instead of lurching seems to be a function of the cerebellum."

Cautionary Words

Jay Giedd and his colleagues have given us a new window into understanding how the pre-adolescent brain develops. It confirms what other neuroscientists have outlined over the past 25 years -- that different parts of the brain mature at different times. In particular, it corroborates the work of neuroscientists like Peter Huttenlocher who have shown that the frontal cortex of human beings matures relatively late in a child's life.

However, knowing more about the *structure* of the brain does not necessarily tell us more about the *function* of the brain. It is a good hypothesis that if a particular structure is still immature, the functions it governs will show immaturity. Thus, there is fairly widespread agreement that adolescents take more risks at least partly because they have a immature frontal cortex, because this is the area of the brain that takes a second look at something and reasons about a particular behavior. However, moving from structure to function, deciding what *behavior* is caused by what part of the brain, is much more complicated.

Jack Shonkoff, professor of child development at Brandeis University and author of *From Neurons to Neighborhoods*, warns policymakers to be careful about interpreting the findings of neuroscientists too simplistically. In his interview with FRONTLINE, Shonkoff says, "The caution is really to be careful about what's not quite ready for prime time yet in terms of application."

John Bruer, the author of *The Myth of the First Three Years* and the president of the James S. McDonnell Foundation, is more blunt. Says Bruer: "This simple, popular, newsweekly-magazine idea that adolescents are difficult because their frontal lobes aren't mature is one we should be very cautious of. Yes, there are adolescents that are hard to get along with. There are adults that are hard to get along with for the same reason. Presumably, the adults have mature frontal areas. There are very young children who seem to have no problem with this. Very immature brain structure, yet results in very sophisticated behavior. So this notion there's going to be some easy connection between counting synapses or measuring white matter and the kinds of behaviors people display or we want them to display is one we're going to have to do a lot more work on before it's science."

Despite the caveats about how much we can know about brain function and how readily any of this work can be translated into policy, it is clear from the research that the brain is a good deal more plastic or changeable than we once thought. Important structural changes are taking place well into adolescence and beyond. Except for a few well-defined sensitive periods for certain types of vision, hearing, and first-language learning, the brain is capable of growth well beyond the first few years of life. An important part of the growth is happening just before puberty and well into adolescence. The brain research adds new dimensions to our understanding of adolescence -- a time of both heightened opportunity and risk.

INTERVIEW

Deborah Yurgelun-Todd

In a recent study mapping differences between the brains of adults and teens, Todd put teenage and adult volunteers through a MRI and monitored how their brains responded to a series of pictures. The volunteers were asked to discern the emotion a series of faces like this one. The results were surprising. All the adults identified the emotion as fear, but many of the teenagers saw something different, such as shock or anger. When she examined their brain scans, Todd found that the teenagers were using a different part of their brain when reading the images.

Yurgelun-Todd is the director of neuropsychology and cognitive neuroimaging at McLean Hospital in Belmont, Mass. Her recent work suggests that teens' brains actually work differently than adults' when processing emotional information from external stimuli.

Do you notice a big difference between young teenagers and older teenagers, for instance, or adults?

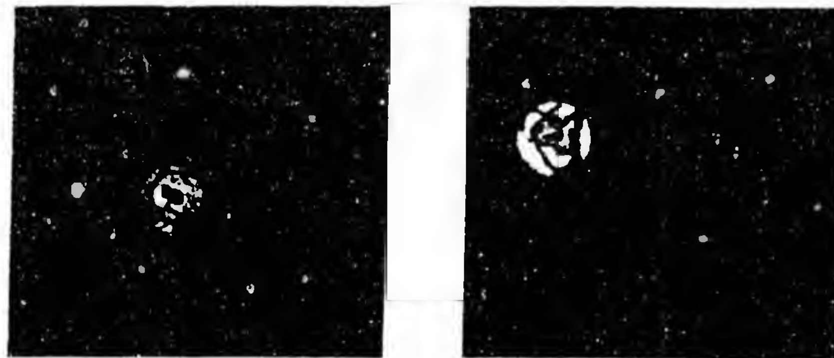
Yes. Our data suggested that the younger teenagers were significantly different in how they responded compared to adults. And we did see an age-dependent or age-related change between the ages of 11 and 17, with the most dramatic difference being in the earlier teen years.

One aspect of our work has been to look at the frontal part of the brain, which has been known to underlie thought and anticipation and planning and goal-directed behavior, and try to understand the relationship of this part of the brain to the more inferior or lower part of the brain which has been associated with emotion and gut responses. It's quite well known that, in adults, there's a relationship between these two parts of the brain, and we wanted to understand what that relationship would be in adolescent subjects.

In adults, how are those two parts of the brain related?

What do we see there?

In an adult, this anterior or prefrontal part of the brain carries out a lot of executive functions, or what we call more thinking functions: planning, goal-directed behavior, judgment, insight. And we think that that particular part of the brain influences this more emotional or gut part of the brain. Therefore this relationship is key to understanding behavior.



Teens **(left)** used less of the prefrontal (upper) region than adults **(right)** when reading emotion.

This is a really nice picture highlighting the fact that in an adolescent brain or a younger brain, the relative activation of the prefrontal region or this anterior front part of the brain is less it is in the adults. But in contrast to that, the more emotional region or that gut response region has more activation compared to the adult. So the relationship between these two regions is very different. And we think that that's been a very important finding in terms of understanding adolescent behavior.

So, confronted with a feeling, say, somebody looks at them with an expression of fear, how will the adolescent read it in relation to the adult?

... The adolescent will have a more of an emotional response. The part of the brain that has more of that gut reaction will respond to a greater extent than the adult brain will. And we think that that is due to the fact that this frontal region is not interacting with the emotional region in the same way.

How about this issue of misjudgment -- making mistakes about what they read on a person's face?

One of the things that we noticed in doing this experiment was, not only did the adolescents show this emotional response or this increased response, but they did this at the same time that they did not correctly identify the emotion. And that was very interesting to us, because it's clear that the brain was responding, but the way it was responding didn't have to do with the accuracy of the affect or the emotional expression. The adolescents typically said that they saw shock or confusion or sadness. But

they did not correctly identify fear 100 percent of the time. This is in contrast to the adults, who did find that

So 100 percent of the adults correctly identified the emotion of fear?

Right. In this pilot study, 100 percent of the adults did actually identify the emotion as fear.

And the teenagers?

Only about half.

What did they say instead?

They felt tha' the expression was sadness, confusion. Some said they didn't know; some said shock. But it was surprising to us that most fairly sophisticated adolescents did not correctly identify fear. ...

Is it possible that if you had interviewed ten more adults and ten more teens, the results would have changed?

This is a small pilot study, so clearly if we added a considerably larger sample, we may have very different results. So I want to be cautious and not over-interpret these findings.

"The frontal lobe, that part of the executive region that we studied, is not always functioning fully in teenagers. ... That would suggest that therefore teenagers aren't thinking through the consequences of their behaviors."

What does your work tell you about young teenagers?

One of the implications of this work is that the brain is responding differently to the outside world in teenagers compared to adults. And in particular, with emotional information, the teenager's brain may be responding with more of a gut reaction than an executive or more thinking kind of response. And if that's the case, then one of the things that you expect is that you'll have more of an impulsive behavioral response, instead of a necessarily thoughtful or measured kind of response

Does this research go part of the way to explaining the miscues between adult and teenagers?

Yes, I do think this research goes to helping understand differences between adults and teenagers in terms of communications. And I think that it does for two reasons. One, we saw that adults can actually look at fearful faces and perceive them as fearful faces, and they label them as such, whereas teenagers ... don't label them the same way. So it means that they're reading external visual cues [differently], or they're looking at affect differently.

The second aspect of the findings are that the frontal region, or this executive region, is activating differentially in the teenagers compared to adults. And I think that has important implications in terms of modulating their own responses, or trying to inhibit their own gut responses.

Talk more about that in terms of the kind of risks that teenagers take. When they exhibit risky behavior, what is actually happening?

One thing that happens in the brain when we're going to get involved in any activity or initiate any activity is, we either have to decide what the consequences of that behavior are, or we're just going to behave impulsively. And to appreciate what the consequences of a behavior are, you have to really think through what the potential outcomes of a behavior are. I think the frontal lobe, that part of the executive region that we studied, is not always functioning fully in teen _ers; or least our data suggests that perhaps it's not.

That would suggest that therefore teenagers aren't thinking through what the consequences of their behaviors are, which would lead us to believe that they'd be more impulsive, because they're not going to be so worried about whether or not what they're doing has a negative consequence. ...

Our findings suggest that what is coming into the brain, how it's being organized, and then ultimately the response -- all three of those may be different in our adolescents. So that attitude may be part of that, or may be related to that. But it's not simply a matter of teenagers feeling like they don't want to do something, or that they're just going to give you a hard time. ...

What does this mean for teens' relationship with their parents and teachers?

One of the interesting things about the findings are that they suggest that the teenagers are not able to correctly read all the feelings in the adult face. So that would suggest to us that when they're relating to their parents or to their friends' parents or to their teachers, they may be misperceiving or misunderstanding some of the feelings that we have as adults; that is, they see anger when there isn't anger, or sadness when there isn't sadness. And if that's the case, then clearly their own behavior is not going to match that of the adult. So you'll see miscommunication, both in terms of what they think

the adult is feeling, but also what the response should then be to that.

Is there a difference between boys and girls?

Yes. Actually it's very interesting that in our study we found quite a bit of difference between males and females. And this really didn't surprise us. We found that females were somewhat more accurate than males, and also a little bit more subdued, relative to males. ... In general, the males in our studies showed more reaction from that gut region of the brain, and less frontal or executive reaction. The relationship between the gut response and that executive region was very striking for the males, and somewhat striking for the females. ut was not as extreme for the teenage females compared to the teenage males. ....

So what does this mean about the kind of decisions that a teenager makes?

One of the interesting outcomes of this study suggests that perhaps decision-making in teenagers is not what we thought. That is, they may not be as mature as we had originally thought. Just because they're physically mature, they may not appreciate the consequences or weigh information the same way as adults do. So we may be mistaken if we think that [although] somebody looks physically mature, their brain may in fact not be mature, and not weigh in the same way. ...

Certainly the data from this study would suggest that one of the things that teenagers seem to do is to respond more strongly with gut response than they do with evaluating the consequences of what they're doing. This would result in a more impulsive, more gut-oriented response in terms of behavior, so that they would be different than adults. They would be more spontaneous, and less inhibited. ...

Do you think there should be things done for teenagers that are not done right now?

That's a really interesting point, because enrichment or special kinds of education during this period of time are very valuable; the brain is ready and responsive in a way that it's not later in life. And one of the questions is whether or not we can teach teenagers or adolescents to be more discriminating in interpersonal communication.

For example, many adults say that one of the things that they felt most limited by is the ability to have a really good relationship, a really intimate relationship with another person. And the basis of that really comes out of being able to read cues and being able to relate to others. So I think that the teenage years are important years for learning these skills. We assume that teenagers are getting those skills at home, or we think that they're getting them in groups that they participate in, such as Boy Scouts, Girl Scouts, clubs that they belong to. But for perhaps many of our teens, they're not

Login Register eMedicine The Medscape Journal

Latest News CME Conferences Resource Centers Journals & Reference Experts & Viewpoints

Search Medscape, eMedicine, MEDLINE and Drug Reference Search

IN THIS ARTICLE

The Teen Brain and the Pediatric Nurse
The Teen Brain: Under Construction
The Teen Brain: Patterns of Development
The Brain Matures: Emotions and Development
The Teen Brain: Thrills, Peers, and Stress
Variables Impacting the Teen Brain: Sleep and Gender
Pediatric Nursing Implications
Conclusions
References

Printer-Friendly Email This Discuss This

The Teen Brain: Under Construction

Information from Industry
EVISTA® (raloxifene HCL) – Reduced the risk for first vertebral fracture and invasive breast cancer in postmenopausal women with osteoporosis.
Important Safety Information
Prescribing Information

Many nurses are under the impression that the brain is largely developed during the school age years, simply maturing during the adolescent years. Resources profess that the most rapid proliferation of brain cells is in utero and that the structure of the human brain is laid down by age 3, with maturation attained between 10 and 12 years old. It is also espoused that the stress and storm inherent in the adolescent years is largely based on hormonal influences, leading those who work with teens to attribute the mood swings, vacillating judgments, and difficult dispositions to estrogen and testosterone. Concepts of cognitive reasoning, as laid down by Jean Piaget, propose that formal operational/abstract thinking - the highest level of reasoning - emerges between 11 and 14 years of age (Hockenberry, 2003).

Several studies have refuted these findings, indicating that the brain is actively growing throughout the teen years and is, in fact, changing until young adulthood (Spano, 2003). Several researchers contend that, based on physiological research alone, brain development extends well into the twenties, causing some to consider the adolescent period to range from 11-25 years of age (Spear, 2002). New information indicates that early adolescence is a period of significant brain growth and development characterized by three distinct processes: proliferation, pruning, and myelinization (Spano, 2003).

Prior thinking indicated that no new neurons were formed after the gestational growth spurt (Hockenberry, 2003). It was proposed that 90%-95% of the total brain cells are formed by the age of 6 (Wallis, 2004). In contrast, new research purports that many cells are formed early in adolescence in response to genetic, hormonal, and environmental cues. There is a significant increase in the amount or proliferation of brain gray matter, or unmyelinated cells, during this period (National Institute of Mental Health [NIMH], 2001). This growth, thought to peak at 11 years in girls and at 12 BD years in boys, allows nerve cells to grow and get "bushier" in response to stimuli, implying that selected stimuli may increase the number of nerve cells (Wallis, 2004, p. 59). This is not to say that humans can train their brains to grow in certain areas, but it may indicate further areas for research (Spano, 2003).

The pruning process is more complex and less familiar to nurses. The pruning process is essentially a cleaning out of nerve fibers, allowing for stronger but fewer nervous system cellular connections. Unused neurons and dendrites are eliminated to decrease the "clutter" in the brain (Spear, 2000, p. 112). The pruning process is thought to work on a "use it or lose it" basis, in which nerve cells that are not cultivated are pruned and those that are nurtured are allowed to flourish (NIMH, 2001, p. 1). This pruning results in a strengthening of connections among those neuronal pathways that are the most used and stimulated. It is here where many neuroscientists believe there may be some implications for guiding youth development and decision-making (Spano, 2003). Scientists have conjectured that teens may exercise selected brain cells and allow others to atrophy in order to influence the "hardwiring of the brain" (Spano, 2003, p. 37). This thinning out process is thought to continue well into the 20s.

The pruning process occurs primarily in the areas of the brain that govern selected functions, such as self-control, judgment, emotions, organization, multitasking, and goal-directed behaviors. The positive ramifications of the pruning process are the subject of current research. The potential for selective pruning, the impact of activities, discipline, and limits on the pruning process, the effect of genetic and hormonal influences dictating appropriate pruning, and the ability for genes, environment, and experiences to change the pruning process are all under research scrutiny (NIMH, 2001). The implications of inefficient, inappropriate, or overzealous pruning are also the topics of continued inquiry. Possible issues such as poo

Is your patient's drug regimen safe?

SEARCH

Medscape
MEDLINE
Drug Reference
Advanced Search

NEW in Drug Reference:
Multi-Drug Interaction Checker
from Medscape.com

Check for drug interactions
click here

decision-making, reckless behavior, rule breaking, the tendency toward emotional outbursts, fewer organizational abilities, and lack of ability to process abstract concepts have been associated with problems in pruning (Begley, 2000).

Research conducted by Spear (2002) investigated the association between the pruning phase and the effects of alcohol. This research postulated that overuse of alcohol during

This paper reflects the research and thoughts of a student at the time the paper was written for a course at Bryn Mawr College. Like other materials on Serendip, it is not intended to be "authoritative" but rather to help others further develop their own explorations. **Web links were active as of the time the paper was posted but are not updated.**

Contribute Thoughts | Search Serendip for Other Papers | Serendip Home Page

Biology 202, Spring 2005
Second Web Papers
On Serendip

Confessions of a Teenage Mind

Katherine Cheng

Statistics provided by the National Center for Statistics and Analysis show that though adolescents aged 15-20 year old constitute only 6.4% of 194.3 million licensed drivers in the United States, they are involved in 14% of vehicular accident-related fatalities. In 2003 alone, 7,884 adolescent drivers were involved in fatal crashes, almost half (3,657) of which were caused by the teenage drivers. With such high accident rates, car collisions constitute the number one killer of Americans aged 15-20 years. 1). Traditionally, the frequency of adolescent automobile accidents has been attributed to factors such as alcohol intoxication, drowsiness and inexperience. While such explanations remain legitimate concerns, recent scientific research suggests that a significant component of the answer may in fact lie in the very structure of the teenage brain.

Until fairly recently, researchers and medical practitioners presumed that a brain's course of development corresponded to its physical growth, so that by the time the brain grew to 95% of its adult size around age six, it would be impervious to change. Earlier studies had determined that during gestation in the womb and the first 18 months of life, a child's brain undergoes a stage referred to as "overproduction," during which the brain produces an excessive amount of cells and neural connections. Those that are not used are "pruned," or removed, a process that scientists once believed to signal the end of the brain's development. 2)A longitudinal study conducted by Dr. Judith Rapoport of the National Institute of Mental Health, however, revealed evidence to the contrary. Utilizing MRI (magnetic resonance imaging) to scan the brains of 149 children and adolescents at two year intervals, Rapoport found that brains continue to develop well into adolescence, engaging in a second stage of overproduction characterized by a thickening of the brain's grey matter, the nervous tissue responsible for information processing. 3) The frontal lobes, a division of the cerebral cortex that manages emotions, personality, impulses and reasoning, undergo particularly significant growth, but by puberty, the second stage of overproduction beings to wane. 4)
for Teenagers." From this point on, the grey matter thins as it prunes away cells and synapses that have not been used and trained in the learning of new skills, such as violin playing. 2)

Significantly, the frontal lobes, which inhibit behavior, are one of the last divisions of the brain to finish developing. Researchers now speculate that this division of the brain responsible for making "executive decisions" based on methodical rational thinking and planning continues to develop throughout a

person's early 20's. Thus, while the frontal lobes develop, other parts of the brain help process emotional information normally handled by fully-developed frontal lobes. A 1999 study conducted by Deborah Yurgelun-Todd, Director of Neuro-psychology and Cognitive Neuro-imaging at McLean Hospital in Belmont, Massachusetts, demonstrates as much. Expanding upon the research initiated by Rapoport, Yurgelun-Todd and colleagues showed adult and teenage subjects photographs of various facial expressions and asked them to articulate the illustrated emotion. While they deliberated, Yurgelun-Todd and colleagues employed MRI to scan the subjects' brains. Interestingly, they discovered that half of the teenage subjects incorrectly identified expressions of fear as sadness or shock, while every adult subject correctly identified the emotion of fear. Close inspection of the MRI revealed that the teenage and adult brains employed different parts of the brain to process the emotional information. 5) Compared to the teenagers, the adult subjects experienced heightened activity in their frontal lobes and lesser activity in the amygdale, the part of the brain involved with emotional and 'gut' responses. 4) This finding implies that teenage brains, by virtue of their immature frontal lobes, are not completely equipped to think through their behaviors and responses using the cognitive reasoning processes matured and available in normal adult brains. Until their frontal lobes have fully developed, adolescents and teenagers react to and interpret the external clues provided by the world through a lens significantly colored by emotional and "gut feeling" reactions, oftentimes relying on impulse rather than cool-headed critical analysis of a situation and potential consequences.

This insight into the developing structure of the teenage brain sheds new light on the sometimes seemingly perplexing and unnecessarily risky behavior of teenagers and adolescents, particularly when placed within the context of driving. Due to frequency of exposure and inevitability of interaction, it is reasonable to speculate that teenagers are frequently involved in car collisions because they misinterpret the behaviors of other drivers as threatening and therefore drive more aggressively, or perhaps some drive more recklessly because they do not fully think through the consequences of their decisions, particularly in high-stress driving conditions. But all of this is not to say that teenagers are incapable of processing situations and weighing the possible positive and negative outcomes of certain behaviors. Instead, it clearly makes evident that well beyond the age societal standards consider the start of adulthood, young brains interpret the world in ways markedly different from brains in which matured frontal lobes privilege rational judgment and behavior control over emotion-inspired impulsivity. This information must be taken into consideration when dealing with teenagers and adolescents in both personal and social capacities and guiding the development of their brains. During this crucial period of development, adolescents and teenagers should be encouraged to participate in the learning of various skills and activities. Never again will grey matter be more abundant, the brain more fruitful and plastic to change and development.

Moreover, these findings give rise to some interesting ethical questions. If scientific research demonstrates that in general, people do not maintain full possession of their cognitive faculties until their mid-twenties, these studies conceivably justify movements to enforce stricter guidelines on the behavior and rights of adolescents and young adults. In 1984, President Ronald Reagan signed into law the national 21 minimum drinking age legislation, since which alcohol-related car collisions and associated fatalities have decreased. 7) At the very least, these recent findings provide scientific evidence verifying the logic of this law, but for proponents of a higher drinking and/or driving age, this research stands as support for tighter regulations of teenage drivers. In the past few years, many states have already passed legislation limiting the use of cellular phones while driving and restricting the number of passengers a teenage driver may have in the car at one time.

Applying the same vein of thinking to a different context, opponents of the military draft can use this research to argue against the recruitment of individuals under the age of 25 for two reasons, the most obvious being that young men and women are simply too cognitively underdeveloped to function well in such situations in which they'd be forced to make decisions that would very literally be matters of life or

death. If injuries and fatalities caused by car collisions are already a significant concern, one can only imagine the repercussions of arming a squad of young soldiers with machine guns and the authority to shoot. Secondly, the teenage and young adult years are the most formative of a person's life. If conditioned to observe and participate regularly in the systematic violence of military life, beliefs, norms and behaviors integral to this lifestyle will indubitably become ingrained within the young men and women, possibly replicating themselves once the individual returns to civilian life. Likewise, but to a different effect, the discovery that the brain maintains a significant degree of plasticity throughout adolescence gives rise to the hope that during this crucial period, individuals experience behavioral problems can change relatively easily. Regardless, the research discussed here verified, at the very least, that we have barely grazed the surface of the amazingly complex organ that is the human brain.

Web Sources

1) National Highway Traffic Safety Administration, NHTSA Traffic Facts: 2003

2) Frontline: Inside the Teen Brain, Interview with neuroscientist Jay Giedd.

3) National Institute of Mental Health, "Teen Brain: A work in progress."

4) Talukder, Gargi, "Decision-making is Still a Work in Progress for Teenagers."

5) Frontline: Inside the Teen Brain, Interview with director of neuropsychology and cognitive neuroimaging Deborah Yurgelun-Todd.

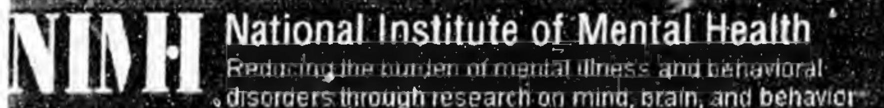
6) http://www.brainconnection.com/topics/?main=news-in-rev/teen-frontal

7) Mothers Against Drunk Driving, "On 20th Anniversary Of 21 Minimum Drinking Age Law."

| Course Home | Serendip Home |

Send us your comments at Serendip

© by Serendip 1994-2008 - Last Modified: Wednesday, 04-May-2005 10:56:27 EDT



Teenage Brain: A work in progress

New imaging studies are revealing—for the first time—patterns of brain development that extend into the teenage years. Although scientists don't know yet what accounts for the observed changes, they may parallel a pruning process that occurs early in life that appears to follow the principle of "use-it-or-lose-it:" neural connections, or synapses, that get exercised are retained, while those that don't are lost. At least, this is what studies of animals' developing visual systems suggest. While it's known that both genes and environment play major roles in shaping early brain development, science still has much to learn about the relative influence of experience versus genes on the later maturation of the brain. Animal studies support a role for experience in late development, but no animal species undergoes anything comparable to humans' protracted childhood and adolescence. Nor is it yet clear whether experience actually creates new neurons and synapses, or merely establishes transitory functional changes. Nonetheless, it's tempting to interpret the new findings as empowering teens to protect and nurture their brain as a work in progress.

The newfound appreciation of the dynamic nature of the teen brain is emerging from MRI (magnetic resonance imaging) studies that scan a child's brain every two years, as he or she grows up. Individual brains differ enough that only broad generalizations can be made from comparisons of different individuals at different ages. But following the same brains as they mature allows scientists a much finer-grained view into developmental changes. In the first such longitudinal study of 145 children and adolescents, reported in 1999, NIMH's Dr Judith Rapoport and colleagues were surprised to discover a second wave of overproduction of gray matter, the thinking part of the brain—neurons and their branch-like extensions—just prior to puberty.[1] Possibly related to the influence of surging sex hormones, this thickening peaks at around age 11 in girls, 12 in boys, after which the gray matter actually thins some.

Prior to this study, research had shown that the brain overproduced gray matter for a brief period in early development—in the womb and for about the first 18 months of life—and then underwent just one bout of pruning. Researchers are now confronted with structural changes that occur much later in adolescence. The teen's gray matter waxes and wanes in different functional brain areas at different times in development. For example, the gray matter growth spurt just prior to puberty predominates in the frontal lobe, the seat of "executive functions"—planning, impulse control and reasoning. In teens affected by a rare, childhood onset form of schizophrenia that impairs these functions, the MRI scans revealed four times as much gray matter loss in the frontal lobe as

Options:

Order a hardcopy

See all publications on: Basic Research

Browse Mental Health Topics

About NIMH Publications

normally occurs.[3] Unlike gray matter, the brain's white matter—wire-like fibers that establish neurons' long-distance connections between brain regions—thickens progressively from birth in humans. A layer of insulation called myelin progressively envelops these nerve fibers, making them more efficient, just like insulation on electric wires improves their conductivity.

Advancements in MRI image analysis are providing new insights into how the brain develops. UCLA's Dr. Arthur Toga and colleagues turned the NIMH team's MRI scan data into 4-D time-lapse animations of children's brains morphing as they grow up—the 4th dimension being rate-of-change. Researchers report a wave of white matter growth that begins at the front of the brain in early childhood, moves rearward, and then subsides after puberty. Striking growth spurts can be seen from ages 6 to 13 in areas connecting brain regions specialized for language and understanding spatial relations, the temporal and parietal lobes. This growth drops off sharply after age 12, coinciding with the end of a critical period for learning languages.

While this work suggests a wave of brain white matter development that flows from front to back, animal, functional brain imaging and postmortem studies have suggested that gray matter maturation flows in the opposite direction, with the frontal lobes not fully maturing until young adulthood. To confirm this in living humans, the UCLA researchers compared MRI scans of young adults, 23-30, with those of teens, 12-16.[4] They looked for signs of myelin, which would imply more mature, efficient connections, within gray matter. As expected, areas of the frontal lobe showed the largest differences between young adults and teens. This increased myelination in the adult frontal cortex likely relates to the maturation of cognitive processing and other "executive" functions. Parietal and temporal areas mediating spatial, sensory, auditory and language functions appeared largely mature in the teen brain. The observed late maturation of the frontal lobe conspicuously coincides with the typical age-of-onset of schizophrenia—late teens, early twenties—which, as noted earlier, is characterized by impaired "executive" functioning.

Another series of MRI studies is shedding light on how teens may process emotions differently than adults. Using functional MRI (fMRI), a team led by Dr Deborah Yurgelun-Todd at Harvard's McLean Hospital scanned subjects' brain activity while they identified emotions on pictures of faces displayed on a computer screen. Young teens, who characteristically perform poorly on the task, activated the amygdala, a brain center that mediates fear and other "gut" reactions, more than the frontal lobe. As teens grow older, their brain activity during this task tends to shift to the frontal lobe, leading to more reasoned perceptions and improved performance. Similarly, the researchers saw a shift in activation from the temporal lobe to the frontal lobe during a language skills task, as teens got older. These functional changes paralleled structural changes in temporal lobe white matter.

While these studies have shown remarkable changes that occur in the brain during the teen years, they also demonstrate what every parent can confirm: the teenage brain is a very complicated and dynamic arena, one that is not easily understood.

References

[1] Giedd JN, Blumenthal J, Jeffries NO, et al. Brain development during childhood and adolescence: a longitudinal MRI study. *Nature Neuroscience*, 1999; 2(10): 861-3.

[2] Rapoport JL, Giedd JN, Blumenthal J, et al. Progressive cortical change during adolescence in childhood-onset schizophrenia. A longitudinal magnetic resonance imaging study. *Archives of General Psychiatry*, 1999; 56(7): 649-54.

[3] Thompson PM, Giedd JN, Woods RP, et al. Growth patterns in the developing brain detected by using continuum mechanical tensor maps. *Nature*, 2000; 404 (6774): 190-3.

[4] Sowell ER, Thompson PM, Holmes CJ, et al. In vivo evidence for post-adolescent brain maturation in frontal and striatal regions. *Nature Neuroscience*, 1999; 2(10): 859-61.

[5] Baird AA, Gruber SA, Fein DA, et al. Functional magnetic resonance imaging of facial affect recognition in children and adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 1999; 38(2): 195-9.

NIH Publication No. 01-4929

Some NIMH pages link to PDF files. Download Adobe Reader to view and print PDF files.

This page last reviewed: February 28, 2008

Site Map | Subscribe | Staff Directories | Contact NIMH | Jobs | Copyright | Privacy Notice | Policies | FOIA

The National Institute of Mental Health (NIMH) is part of the National Institutes of Health (NIH), a component of the U.S. Department of Health and Human Services.

COGNITIVE AND MORAL DEVELOPMENT, BRAIN DEVELOPMENT, AND MENTAL ILLNESS: IMPORTANT CONSIDERATIONS FOR THE JUVENILE JUSTICE SYSTEM

Joel V. Oberstar,[†] Elise M. Anderson,[††] and Jonathan B. Jensen[†††]

I. INTRODUCTION 1051
II. PIAGET AND KOHLBERG: TWO INFLUENTIAL THEORIES OF CHILD DEVELOPMENT 1052
III. UNDERSTANDING NORMAL BRAIN DEVELOPMENT 1054
IV. BRAIN DEVELOPMENT AND MENTAL ILLNESS 1057
V. FORENSIC IMPLICATIONS OF THE PROCESS OF BRAIN DEVELOPMENT AND MENTAL ILLNESS 1059
VI. CONCLUSION 1061

I. INTRODUCTION

Since Illinois created the nation's first juvenile court in 1899,[1] the legal system has recognized that juveniles are different than adults in many ways and, consequently, should be treated differently by the courts. Children and adolescents are, by definition, a "work in progress" and early intervention can help reshape detrimental cognition and behavior. It is with this focus that juvenile courts emphasize *rehabilitation* rather than *punishment*. Different theories have been put forth to explain the thought

† Joel V. Oberstar is a child and adolescent psychiatry fellow at the University of Minnesota. He holds an M.D. from the University of Minnesota and completed three years of general psychiatry training at the Harvard Longwood Psychiatry Residency Training Program prior to beginning his fellowship.

†† Elise M. Anderson is a student at William Mitchell College of Law. She anticipates receiving a J.D. in 2006.

††† Jonathan B. Jensen is an Associate Professor of Psychiatry and Director of Residency Training and Education in Child and Adolescent Psychiatry at the University of Minnesota. He holds an M.D. from the University of Minnesota.

1. PRINCIPLES AND PRACTICE OF CHILD AND ADOLESCENT FORENSIC PSYCHIATRY 259 (Diane H. Schetky & Elissa P. Benedek eds., 2002).

processes and behaviors youth exhibit during the first two decades of their lives. Recent research into the development of the human brain has supported these theories and has allowed for an expanded understanding of cognitive and behavioral maturation during childhood.

The purpose of this Article is fourfold: (1) to outline two psychological theories concerning cognitive and moral development in children;[2] (2) to summarize recent research on juvenile brain development and related implications for understanding juveniles' behaviors;[3] (3) to explain how mental illness may impact brain development (and thereby influence cognition and behavior);[4] and (4) to discuss the integration of psychological theory, brain development, and mental illness with the juvenile justice system.[5]

II. PIAGET AND KOHLBERG: TWO INFLUENTIAL THEORIES OF CHILD DEVELOPMENT

Numerous efforts have been made to describe the maturation processes children undergo. Theories regarding emotional, social, behavioral, moral, and cognitive development have been proposed. One influential model of cognitive development was articulated by Jean Piaget, who theorized that children move sequentially through four stages of cognitive development.[6] First, in the *sensorimotor stage* (birth to about eighteen to twenty-four months), children receive environmental stimuli and react in stereotyped manners.[7] Later, in the *pre-operational stage* (age two years to about age five to seven years), children exhibit egocentric thinking (everything is about the child) and magical thinking (reality and fantasy are interwoven). Children in these ages demonstrate early stages of moral thinking, in which things are thought of as either "good" or "bad."[8] Third, children aged six to eleven years begin to show signs of *concrete operations*, in which they exhibit rational and logical

2. *See infra* Part II.
3. *See infra* Part III.
4. *See infra* Part IV.
5. *See infra* Part V.
6. *See* MASS. GEN. HOSP., MASSACHUSETTS GENERAL HOSPITAL PSYCHIATRY UPDATE AND BOARD PREPARATION 29-30 (Theodore A. Stern & John B. Herman eds., 2d ed. 2000); *see also* CHILD AND ADOLESCENT PSYCHIATRY: A COMPREHENSIVE TEXTBOOK 135-38 (Melvin Lewis ed., 2d ed. 1996).
7. CHILD AND ADOLESCENT PSYCHIATRY, *supra* note 6, at 136.
8. *Id.*

thought.[9] A more conceptual framework for understanding the world develops, and children are able to understand another individual's point of view.[10] Lastly, after age eleven years, children develop the capacity for *formal operations*.[11] This stage is marked by enhanced abilities for abstract thinking and deductive reasoning.[12]

Lawrence Kohlberg, a well-known University of Chicago and Harvard University professor and Piaget follower, postulated a system of moral reasoning[13] based on Piaget's model of cognitive development.[14] Kohlberg was intrigued by responses to moral dilemmas and the reasoning used to rationalize behavior.[15] He proposed that behaviors could be ascribed to each of six stages of moral development.[16] In Kohlberg's model, individuals move linearly through stages, though not all people achieve the highest stage of moral reasoning.[17] *Pre-conventional (pre-moral) reasoning* (stages one and two) is often observed in children up to nine years of age.[18] Individuals in stage one demonstrate deference to authority.[19] Avoidance of punishment helps the child develop beliefs about what is "right" and "wrong."[20] In stage two, individuals begin to exhibit behaviors reflecting values of "exchange and reciprocity."[21] One's own needs and the needs of others are met using a "You scratch my back, and I'll scratch yours" approach.[22]

Stages three and four (*conventional reasoning/morality*) are more commonly found in adolescents and adults.[23] They reflect a basic focus on social norms and expectations. Stage three is marked by conformity to rules; approval or disapproval from others

---

9. *Id.* at 137.
10. *Id.*
11. *Id.*
12. *Id.*; *see also* MASS. GEN. HOSP., *supra* note 6, at 27.
13. CHILD AND ADOLESCENT PSYCHIATRY, *supra* note 6, at 215; *see also* PSYCHOLOGY FOR PSYCHIATRISTS 93-95 (Deepa S. Gupta & Rajinder M. Gupta eds., 2000); *Kohlberg's Stages of Moral Development*, WIKIPEDIA, THE FREE ENCYCLOPEDIA, http://en.wikipedia.org/w/index.php?title=Kohlberg's_stages_of_moral_development&oldid=36957739 (last visited Feb. 3, 2006) [hereinafter *Kohlberg's Stages of Moral Development*].
14. ROBERT A. BARON, ESSENTIALS OF PSYCHOLOGY 307 (2d ed. 1999).
15. CHILD AND ADOLESCENT PSYCHIATRY, *supra* note 6, at 215.
16. *Id.*
17. *Id.*
18. *Kohlberg's Stages of Moral Development*, *supra* note 13.
19. CHILD AND ADOLESCENT PSYCHIATRY, *supra* note 6, at 215.
20. PSYCHOLOGY FOR PSYCHIATRISTS, *supra* note 13, at 93.
21. CHILD AND ADOLESCENT PSYCHIATRY, *supra* note 6, at 215.
22. *Kohlberg's Stages of Moral Development*, *supra* note 13.
23. *Id.*

influences the individual's perception of "right" and "wrong."[24] In stage four, individuals focus less on approval or disapproval, instead reasoning that a system of rules is essential to ensuring order in society. Behavior that upholds the social order is seen as being "right."[25] *Post-conventional reasoning* (stages five and six) is typically found only in adults and reflects attainment of self-accepted moral principles and a struggle to go beyond simple "law and order."[26] Stage five reasoning includes behaviors that are adherent to laws to the extent that such laws serve a social purpose. Laws are seen less as an "end" but rather as a "means" to achieving a higher purpose (e.g., social justice or human rights).[27] Laws are not absolute and are thus viewed as subject to change. In stage six, individuals exhibit abstract thinking and reasoning with a goal of adhering to ethical principles through which "justice" can be achieved.[28]

These developmental theories of Piaget and Kohlberg provide a framework for understanding how juveniles think and how they interact with the world around them. By extension, such theories can be useful to a juvenile justice system seeking to intervene when a child exhibits behavior inconsistent with societal expectations. In keeping with these and other psychological constructs, a legal theory informally known as the "rule of sevens" proposes degrees of culpability, or criminal responsibility, based on age.[29] Specifically, there is a presumption of "no culpability" up to age seven years, a "rebuttable presumption of no culpability" from ages seven to fourteen years, and a presumption of "culpability" for those children older than fourteen years.[30] This "rule of sevens" demonstrates the legal system's recognition of the role cognitive and moral development play in understanding juveniles' behavior.

III. UNDERSTANDING NORMAL BRAIN DEVELOPMENT

Until only recently, attempts at comprehensively integrating theories of cognition and behavior with a detailed understanding of brain development have been difficult. Such efforts have relied

24. *Id.*
25. CHILD AND ADOLESCENT PSYCHIATRY, *supra* note 6, at 215.
26. PSYCHOLOGY FOR PSYCHIATRISTS, *supra* note 13, at 95.
27. *Kohlberg's Stages of Moral Development*, *supra* note 13.
28. PSYCHOLOGY FOR PSYCHIATRISTS, *supra* note 13, at 95.
29. *In re* Devon T., 584 A.2d 1287, 1290 (Md. Ct. Spec. App. 1991) (citing WAYNE R. LAFAVE & AUSTIN W. SCOTT, JR., CRIMINAL LAW 398 (2d ed. 1986)).
30. *Id.*

on studying patients who have sustained injuries resulting in brain damage as well as utilizing post-mortem (autopsy) analyses. These methods allowed researchers and clinicians to correlate behavioral observations with observable anatomical pathology.

The case of Phineas Gage provided early information about the role of the frontal lobes of the brain.[31] While working in railroad construction in 1848, an accidental explosion caused a forty-three inch iron bar, one and one quarter inches in diameter at one end and one quarter inch in diameter at the other, to be propelled through Gage's head.[32] Amazingly, the injury did not kill the twenty-five-year-old.[33] It did, however, result in significant damage to the left front part of his brain.[34] Though he recovered physically from his injury, Gage reportedly exhibited a substantial change in his behavior following the accident:

> [B]ecause his personality had changed so much, the contractors who had employed him would not give him his place again. Before the accident he had been their most capable and efficient foreman, one with a well-balanced mind, and who was looked on as a shrewd smart business man. He was now fitful, irreverent, and grossly profane, showing little deference for his fellows. He was also impatient and obstinate, yet capricious and vacillating, unable to settle on any of the plans he devised for future action.[35]

This account highlights the now well-understood fact that different regions of the brain control different aspects of human behavior. Particularly relevant to the issue of juvenile justice, the right and left frontal lobes (located just behind the forehead), are thought to play a role in "executive functions" such as planning, impulse control, and reasoning.[36] Other brain regions, including the cerebellum (located in the back of the head), may assist in these functions as well. Some of Gage's personality changes were likely related to damage to frontal-lobe circuits. By extension, children may exhibit poor impulse control and deficits in planning

---

31. Malcolm Macmillan, *Phineas Gage's Story*, http://www.deakin.edu.au/hbs/GAGEPAGE/Pgstory.htm (last visited Feb. 3, 2006).

32. *Id.*

33. *Id.*

34. *Id.*

35. *Id.*

36. NAT'L INSTITS. OF HEALTH, PUB. NO. 01-4929, TEENAGE BRAIN: A WORK IN PROGRESS (2001), *available at* http://www.nimh.nih.gov/publicat/teenbrain.cfm

because of their incompletely developed frontal lobes.

Recent research has helped elucidate the timeline of normal brain development.[37] It is now postulated that the human brain develops in a nonlinear fashion, with different regions of the brain developing at different times and at different rates. The human brain contains both gray matter and white matter. Gray matter includes nerve cells (and other structures), whereas white matter describes the portion of the nerve that is covered by myelin. Myelin is a substance that "insulates" the message-conducting part of the neuron, allowing signals to travel more quickly and efficiently.

Though total brain size does not change substantially after age five years,[38] it does undergo dramatic changes over the lifetime. Significant changes occur both before and after birth.[39] Gray matter develops in a non-linear manner until puberty, at which time the brain undergoes a wave of gray matter loss (termed "pruning"). This loss is essentially a "use it or lose it" phenomenon that allows the brain to trim unused connections in an effort to enhance the function of the remaining nerves. White matter—the myelin sheathing around nerves that allows for enhanced communications between the cells—increases throughout life. In a study by Jay Giedd and colleagues, frontal lobe gray matter increased over childhood, reaching a maximum size at 12.1 years for males and 11.0 years for females.[40] Temporal lobe gray matter did not reach its maximum until 16.5 years for males and 16.7 years for females.[41] Occipital lobe gray matter increased throughout the age range studied (four to twenty-two years) without evidence of decrease.[42]

The implications of this research are dramatic when considered in the context of the functional maturation process. As Nitin Gogtay and colleagues explain in describing the results of their study:

37. Nitin Gogtay et al., *Dynamic Mapping of Human Cortical Development During Childhood Through Early Adulthood*, 101 PROCEEDINGS NAT'L ACADS. SCI. 8174, 8174-79 (2004).

38. Sarah Durston et al., *Anatomical MRI of the Developing Human Brain: What Have We Learned?*, 40 J. AM. ACAD. CHILD & ADOLESCENT PSYCHIATRY 1012, 1014 (2001).

39. In utero (pre-birth) brain changes are beyond the scope of this article.

40. Jay N. Giedd et al., *Brain Development During Childhood and Adolescence: A Longitudinal MRI Study*, 2 NATURE NEUROSCIENCE 861, 861-63 (1999).

41. *Id.* at 862.

42. *Id.*

> [P]arts of the brain associated with more basic functions matured early: motor and sensory brain areas matured first, followed by areas involved in spatial orientation, speech and language development, and attention (upper and lower parietal lobes). Later to mature were areas involved in executive function, attention, and motor coordination (frontal lobes).[43]

Recognition that the process of human brain development is ongoing throughout childhood and adolescence provides anatomical evidence to support the psychological theories put forth by Piaget, Kohlberg, and others.

IV. BRAIN DEVELOPMENT AND MENTAL ILLNESS

As the case of Phineas Gage and similar cases involving other patients demonstrate, damage to a specific brain region can have dramatic implications for alterations in cognition and behavior. As the medical and scientific communities are gaining a deeper understanding of the process of normal brain development, other researchers have sought to determine if abnormalities in the development or function of specific brain regions can be linked to or implicated in certain mental illnesses. A 1996 study by F. Xavier Castellanos and colleagues demonstrated that males aged five to eighteen years suffering from attention-deficit hyperactivity disorder (ADHD) exhibited a 4.7% smaller total cerebral volume than matched healthy controls (comparison subjects).[44] Additionally, the same research showed that boys with ADHD typically had a smaller right caudate nucleus,[45] a smaller right globus pallidus, a smaller right anterior frontal region, and a smaller cerebellum.[46] A similar study demonstrated that girls with ADHD had a smaller total brain volume, as well as a smaller posterior-inferior cerebellar vermis (a part of the cerebellum) than matched healthy controls.[47]

Imaging studies have revealed anatomical differences in

---

43. *See* Gogtay et al., *supra* note 37 and accompanying text.

44. F. Xavier Castellanos et al., *Quantitative Brain Magnetic Resonance Imaging in Attention-Deficit Hyperactivity Disorder*, 53 ARCHIVES GEN. PSYCHIATRY 607, 607 (1996).

45. *Id.* at 611.

46. *Id.* at 607.

47. F. Xavier Castellanos et al., *Quantitative Brain Magnetic Resonance Imaging in Girls with Attention-Deficit/Hyperactivity Disorder*, 58 ARCHIVES GEN. PSYCHIATRY 289, 289 (2001).

patients suffering from depression, as well. Isabelle Rosso and colleagues recently found that a group of children with depression had significant reductions in amygdala volumes compared to healthy controls.[48] A study by Ronald Steingard and colleagues found that children with depression had smaller whole brain volumes, as well as smaller frontal white matter volumes and larger frontal gray matter volumes.[49] An earlier study revealed that children and adolescents with depression had larger ventricles (the space in which cerebrospinal fluid flows).[50] Additionally, a study of adolescents thirteen to eighteen years of age revealed smaller left hippocampus volumes (by seventeen percent) in those suffering from a major depressive disorder as compared to healthy controls.[51]

Other studies have demonstrated significant differences in children and adolescents suffering from psychotic disorders.[52] Judith Rapoport and colleagues showed that children suffering from schizophrenia had a fourfold greater decrease in gray matter volume during adolescence,[53] while Leslie Jacobsen and colleagues found that children with schizophrenia had a smaller cerebellar vermis than healthy controls.[54] This and other research supports the notion that psychiatric illness is often marked by specific, measurable abnormalities in brain development.

---

48. Isabelle M. Rosso et al., *Amygdala and Hippocampus Volumes in Pediatric Major Depression*, 57 BIOLOGICAL PSYCHIATRY 21, 21 (2005).

49. Ronald J. Steingard et al., *Smaller Frontal Lobe White Matter Volumes in Depressed Adolescents*, 52 BIOLOGICAL PSYCHIATRY 413, 413 (2002).

50. Ronald J. Steingard et al., *Structural Abnormalities in Brain Magnetic Resonance Images of Depressed Children*, 35 J. AM. ACAD. CHILD & ADOLESCENT PSYCHIATRY 307, 310 (1996).

51. Frank P. MacMaster & Vivek Kusumakar, *Hippocampal Volume in Early Onset Depression*, BMC MEDICINE (2004), http://www.biomedcentral.com/1741-7015/2/2.

52. Briefly, psychotic disorders are those in which the patient experiences a loss of reality testing. Psychosis is often marked by experiencing auditory hallucinations, delusional thinking, and other impairing symptoms.

53. Judith L. Rapoport et al., *Progressive Cortical Change During Adolescence in Childhood-Onset Schizophrenia*, 56 ARCHIVES GEN. PSYCHIATRY 649, 649 (1999).

54. Leslie K. Jacobsen et al., *Quantitative Morphology of the Cerebellum and Fourth Ventricle in Childhood-Onset Schizophrenia*, 154 AM. J. PSYCHIATRY 1663, 1663 (1997).

V. FORENSIC IMPLICATIONS OF THE PROCESS OF BRAIN DEVELOPMENT AND MENTAL ILLNESS

The current state of scientific knowledge about the process of normal brain development suggests that full cognitive maturity may not occur until late in adolescence or perhaps not even until the early twenties. Recognition of this fact is critical when considering that juveniles may not possess many of the cognitive abilities assumed present in adults entering the criminal justice system. For example, the Minnesota criminal justice system currently holds that the level of competence necessary to permit a child's participation in juvenile proceedings is the same as the competence level necessary for an adult to stand trial in an adult proceeding.[55] This competence level may be lacking in juveniles, however, as was demonstrated by Thomas Grisso and colleagues in their assessment of adjudicative competence in a group of 927 adolescents (ages eleven to seventeen years) in juvenile detention and community settings.[56] They compared these youth to 466 young adults (ages eighteen to twenty-four years) in jails and in the community.[57] Their assessment included the MacArthur Competence Assessment Tool-Criminal Adjudication (MacCAT-CA) as well as the MacArthur Judgment Evaluation (MacJEN).[58] The MacCAT-CA is "a 22-item structured interview for the pretrial assessment of adjudicative competence. This instrument uses a vignette format and objectively scored questions to standardize the measurement of three competence-related abilities."[59] The MacJEN was designed specifically for the study as a research tool to examine immaturity of judgment.[60]

Grisso and colleagues showed that "youths aged fifteen and younger performed more poorly than young adults, with a greater proportion manifesting a level of impairment consistent with that

55. *In re* Welfare of D.D.N., 582 N.W.2d 278, 282 (Minn. Ct. App. 1998) (citing MINN. R. JUV. DEL. PROC. 20.01, subd. 1(B)).

56. Thomas Grisso et al., *Juveniles' Competence to Stand Trial: A Comparison of Adolescents' and Adults' Capacities as Trial Defendants*, 27 LAW & HUM. BEHAVIOR 333, 333-63 (2003).

57. *Id.*

58. *Id.*

59. *See generally* STEVEN K. HOGE ET AL., MACARTHUR COMPETENCE ASSESSMENT TOOL-CRIMINAL ADJUDICATION (MACCAT-CA™). For a description of the MacCAT-CA, see http://www3.parinc.com/products/product.aspx?Productid=MACCAT-CA.

60. Grisso et al., *supra* note 56, at 333-63.

of persons found incompetent to stand trial."[61] The study further suggested that "adolescents also tended more often than young adults to make choices (e.g., about plea agreements) that reflected compliance with authority, as well as influences of psychosocial immaturity."[62] These results make sense when viewed in the context of theories put forth by Piaget and Kohlberg[63] and when considered with the recognition that fifteen-year-olds are still undergoing the complex process of brain development.

While the process of normal brain development itself puts juveniles at risk for behaviors that may be at odds with societal expectations, juveniles with mental illness may be at added risk of running afoul of the legal system. Indeed, a study of 1829 children (1179 boys and 650 girls) in a Chicago detention center demonstrated that nearly 75% of the girls and more than 66% of the boys had one or more psychiatric disorders.[64] The Colorado Supreme Court recognized as early as 1975 that mental illness can play an important role in the juvenile justice system.[65] The court found that when a juvenile is mentally ill and not competent to proceed in trial, the juvenile is protected under Colorado law from having to answer to the charges against him or her.[66] In making this finding, the court concluded that the child need only meet the lesser burden of proof for mental illness rather than the stricter burden required for an insanity defense.[67]

Many jurisdictions have recognized the complexities inherent in working with juveniles suffering from mental illnesses. Wraparound programs in Wisconsin

> provide treatment and service coordination for delinquent and nondelinquent youth with mental health disorders, with the goal of keeping youth in the community and with their families when possible. Using blended funding from the juvenile justice and child welfare systems, Wraparound Milwaukee allows families to select from among an array of services and providers, and

---

61. *Id.*

62. *Id.*

63. *See supra* Part II.

64. DEP'T OF HEALTH & HUM. SERVS., REPORT OF THE SURGEON GENERAL'S CONFERENCE ON CHILDREN'S MENTAL HEALTH: A NATIONAL ACTION AGENDA (2000), *available at* http://www.surgeongeneral.gov/topics/cmh/childreport.htm.

65. *See generally* Briones v. Juvenile Court for Denver, 534 P.2d 624 (Colo. 1975).

66. *Id.* at 625.

67. *Id.* at 626.

provides "care coordination" to ensure the best use of resources.[68]

Additionally, the creation and use of juvenile mental health courts, such as those in California and Ohio,[69] is a cost-effective means of reestablishing the rehabilitative mandate of a juvenile justice system established over 100 years ago that strove to treat, not punish, youth offenders in our society.[70]

VI. CONCLUSION

The psychological theories put forth by Piaget and Kohlberg, along with an ever-expanding understanding of normal brain maturation and brain development in the context of mental illness, provide a solid foundation for concluding that children and adolescents really are different than adults. Children truly are "works in progress" in terms of their cognitive capacity and moral reasoning. Behaviors resulting in the juvenile coming into contact with the legal system, as well as the juvenile's capacity to function within that system, must be weighed in that context.

---

68. STEPHEN SMALL ET AL., WHAT WORKS, WISCONSIN: WHAT SCIENCE TELLS US ABOUT COST-EFFECTIVE PROGRAMS FOR JUVENILE DELINQUENCY PREVENTION (2005), *available at* http://www.uwex.edu/ces/flp/families/whatworkswisconsin.pdf (citing Bruce Kamradt, *Wraparound Milwaukee: Aiding Youth with Mental Health Needs*, 7 JUV. JUST. J. 14, 32 (2000)).

69. ELLEN HARRIS & TAMMY SELTZER, JUDGE DAVID L. BAZELON CTR. FOR MENTAL HEALTH LAW, THE ROLE OF SPECIALTY MENTAL HEALTH COURTS IN MEETING THE NEEDS OF JUVENILE OFFENDERS (2004), *available at* http://www.bazelon.org/issues/criminalization/publications/mentalhealthcourt/juvenilemhcourts.htm.

70. *See generally* Patrick Geary, *Juvenile Mental Health Courts and Therapeutic Jurisprudence: Facing the Challenges Posed by Youth with Mental Disabilities in the Juvenile Justice System*, 5 YALE J. HEALTH POL'Y L. & ETHICS 671, 671-72 (2005).

Dynamic Cycles of Cognitive and Brain Development:

Measuring Growth in Mind, Brain, and Education

Kurt W. Fischer

Growth Cycles and Rulers for Brain and Behavior 2

Cycles of Cognitive Development 5

Cycles of Cortical Development 9

Cycles of Learning: Backwards Growth and Microdevelopment 15

Moving from Growth Cycles to Educational Implications 17

List of Figures 21

References 23

In Battro, A. M., & Fischer, K. W. (Eds.) (2006). The educated brain. Cambridge, U.K.: Cambridge University Press.

Dynamic Cycles of Cognitive and Brain Development:

Measuring Growth in Mind, Brain, and Education

Kurt W. Fischer

Most scientists and teachers find it obvious that cognitive development and brain development go together, and the enterprise of connecting mind, brain, and education starts with that assumption, as evident in most chapters of this book. Knowledge of brain development is growing at a phenomenal rate (Coch, Fischer, & Dawson, in press; Dawson & Fischer, 1994), and knowledge of cognitive development and learning is extensive, deep, and still building (e.g., Case, 1998; Fischer & Bidell, 1998; Fischer & Bidell, 2006, in press; Piaget, 1983; Siegler, 1997). Yet understanding of how cognitive and brain development relate has been minimal. Many brain characteristics – number of neurons and synapses, brain mass, myelination, brain activity, and so forth – change systematically as children grow up. Simultaneously children's actions, speech, concepts, problem solving, social skills, motivation, and emotion develop. All these various changes are globally correlated, but the correlations are not very informative because everything is changing in parallel. Scientists who seek to understand brain-behavior relations and educators who want to use cognitive neuroscience to improve education need ways of finding and analyzing meaningful connections between changes in brain and behavior, moving beyond the finding that characteristics go generally up (some go generally down) with age. Despite these limitations of scientific knowledge, public expectations about relating brain science to educational practice are running far ahead of the realities of scientific knowledge (chapter by Bruer; Fischer, Immordino-Yang, & Waber, 2006).

Meaningful approaches to relating brain and cognitive development are beginning to emerge, however. In one promising arena, the new tools of dynamic systems analysis have combined with the discovery of growth cycles in cognitive and brain development to provide a foundation for moving beyond the difficulties of analyzing brain-behavior relations. Dynamic

systems theory provides tools for analyzing complex patterns of change in individual people, in contrast to traditional tools that focus on analyzing average patterns of change for groups, which smooth out the interesting complexities of individual change (chapter by van Geert & Steenbeck). Research shows that individuals grow in complex patterns, showing not linear change but cycles of jumps and drops (Dawson-Tunik, Commons, Wilson, & Fischer, 2005; Fischer & Bidell, 2006, in press; Molenaar, 2004). These discontinuities and complex patterns provide valuable tools for analyzing development of brain and behavior because scientists can examine relations between the patterns. Evidence is accumulating for cycles of brain growth, cycles of cognitive development, and cycles in learning. All three cycles seem to involve a common process of growth, and one outcome of the research on these growth patterns is the discovery of a general ruler for development and learning that has many uses in educational assessement and practice.

Growth Cycles and Rulers for Brain and Behavior

In living organisms, growth generally occurs through cycles. A prime example is the growth of the cortex, which grows six layers in a cyclical process of neuron generation and migration, as described by Rakic (1971; 1988). A single growth process thus produces six distinct layers in which cells for different layers end up with vastly different functions, even though they are all created by the same process. The process begins as the germinal layer in the embryo's ventricular zone grows new cells in large numbers, and each cell migrates along a ladder created by a glial cell to its destination. The first cells to migrate stop at the first layer of the cortex (dubbed layer six because it is the sixth layer from the top of the cortex, although it is the first one in development of the embryo). After that layer fills up, the cells continue to a higher point to become the second layer, which in turns becomes filled. The next cells then stop at what becomes the third layer, which again becomes filled. This process continues until

the six layers of the cortex are all laid down. In this way one growth process creates cortical layers that end up with very different properties and functions. Within a cortical column, the six layers relate to each other hierarchically, with the lower layers (5 and 6 by conventional numbering) performing more basic functions, such as dealing with basic sensory and motor inputs and outputs, and the higher layers (1 and 2) performing functions that combine, integrate, or differentiate the signals from the lower ones.

Analogous growth cycles seem to occur in brain and cognitive development over time, based on the still young research on growth patterns of brain activity and the more mature evidence on cognitive performance. One of the simplest indexes of the cyclical pattern is that growth occurs with a series of discontinuities – spurts or drops in the simplest case, such as the widely documented spurts in language in the second year (Reznick & Goldfield, 1992). In a study of spontaneous language production in Dutch children Ruhland and van Geert (1998) found that most children showed rapid jumps in performance for specific word categories in the vicinity of 24 months of age, such as the spurt produced by Tomas for use of personal pronouns, shown in Figure 1.

Insert Figure 1 about here.

This spurt at around 24 months comprises one pass through the *growth cycle for cognitive development*, which moves through a series of spurts in performance starting in early infancy and continuing into the 20s (Fischer & Bidell, 2006, in press), as shown for the upper line in Figure 2. Infants, children, adolescents, and young adults all move through periods when their skills are leaping forward at a fast pace, especially under conditions that support optimal performance (upper line). In more ordinary performance, where they are not pushing the limits of their capacity, they commonly show either linear growth or unsystematic change (lower line). The graph presents a summary portrait of the growth patterns for the advanced